11-2005

Salt Lake Fire Management Plan Environmental Assessment

United States Department of the Interior, Bureau of Land Management

United States Department of the Interior
Bureau of Land Management

SALT LAKE
FIRE MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT

UT-020-2004-0091

November 2005

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CHAPTER 1. PURPOSE AND NEED

1.1 INTRODUCTION

This Environmental Assessment (EA) has been prepared to document the results of an analysis of proposed changes to the current management of wildland fire and hazardous fuels for the Bureau of Land Management (BLM) Salt Lake Field Office. Proposed revisions of the Salt Lake Fire Management Plan (FMP) serve as the Proposed Action Alternative for this EA. The revised FMP incorporates current planning requirements associated with fire management on public lands, including wildland fire suppression and fuel treatments. The EA analysis is designed to ensure compliance with the National Environmental Policy Act (NEPA). It allows determinations to be made as to whether any "significant impacts," as defined by the President's Council on Environmental Quality (CEQ) in Regulation 40 CFR 1508.27, could result from the analyzed actions.

An EA provides evidence for determining whether preparation of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) statement is necessary. A Decision Record (DR) that includes a FONSI statement is a document that briefly presents the reasons why implementation of the Proposed Action Alternative would not result in significant environmental impacts (effects) beyond those already addressed within other NEPA and BLM planning documents. If the decision-maker determines that this project would have significant impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a DR may be signed for the EA approving the alternative selected; the DR would identify the fire management decisions associated with the FMP and would provide the language upon which future fire management planning and implementation actions could tier (as per 40 CFR 1502.2). Future site-specific projects would analyze issues in additional implementation-level NEPA documents.

Issues identified for analysis within this EA are included as **Appendix A** (Interdisciplinary Team [IDT] Analysis Record Checklist). This appendix includes the resource concerns identified in the EA, including those resources considered as critical elements of the human environment, and related issues derived from the BLM, affiliated agency resource reviews, and comments received during the public scoping process.

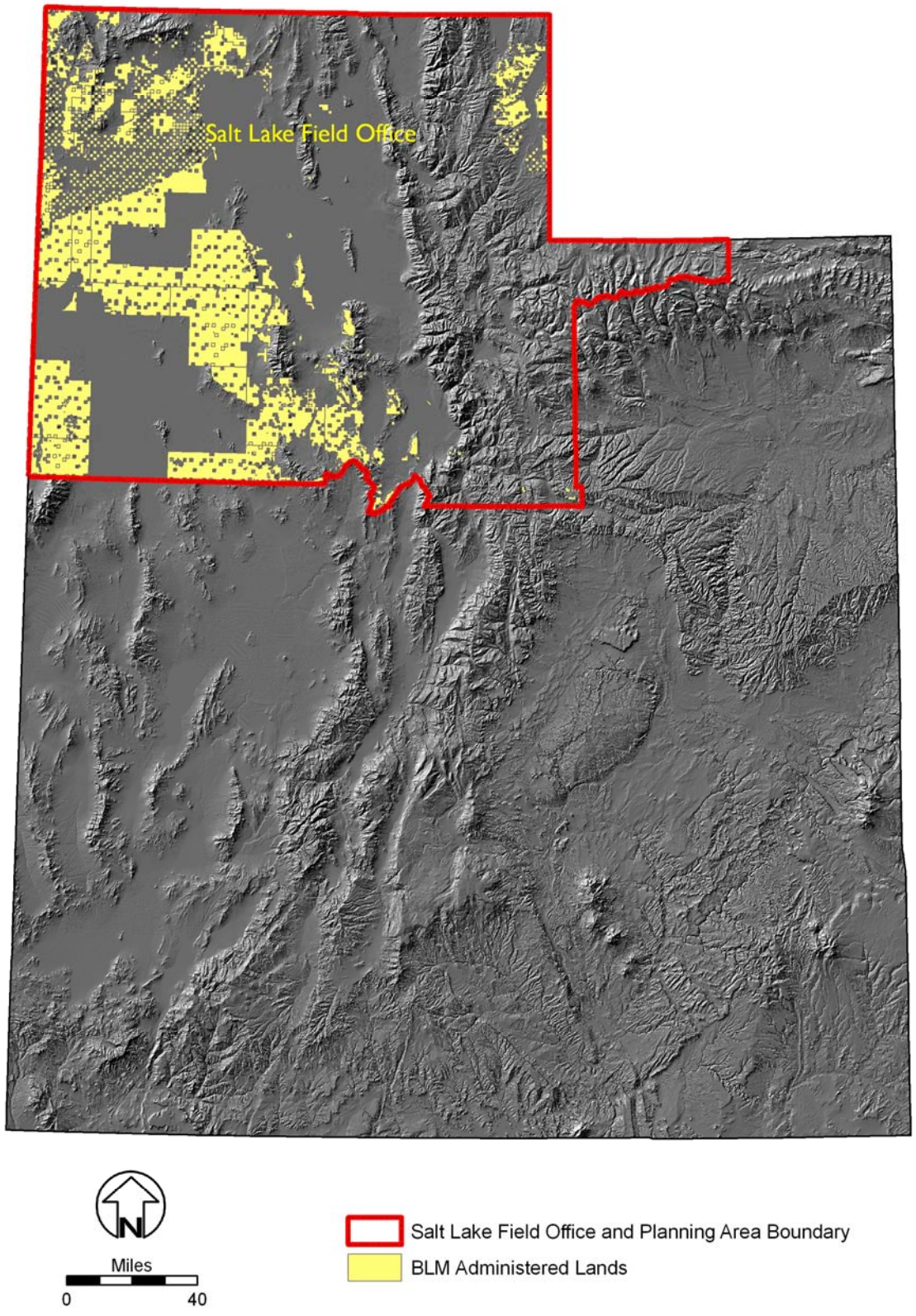
1.2 BACKGROUND

The Salt Lake Field Office (SLFO) evaluated its current FMP and determined that an update was needed to comply with current federal fire management direction. Applicable federal fire management direction is outlined in *Federal Wildland Fire Management Policy and Program Review* (USDI and USDA 1995), *Review and Update of the 1995 Federal Wildland Fire Management Policy* (USDI and USDA 2001a), and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-year Comprehensive Strategy* (USDI and USDA 2001b). Additionally, the focus on hazardous fuel reduction called for by the National Fire Plan and Healthy Forests Restoration Act of 2003 were not anticipated at the time the 1998 FMP was written. Based on this, a revised FMP was prepared.

The Field Office boundary encompasses approximately 15 million acres of land owned and managed by various entities (e.g., public, private, and state). The "planning area" describes the 3.2 million acres of BLM-administered lands within the boundary of the SLFO. BLM lands in the planning area are administered by the SLFO. **Figure 1.1** illustrates the SLFO boundary and BLM-administered lands.

The acreages presented in this EA are approximate, due to slight variations in geographical information system data sets. The variations represent an insignificant quantity of land area and have a negligible effect on analyses of fire management action impacts.

FIGURE 1.1: SALT LAKE FIELD OFFICE BOUNDARIES AND BLM-ADMINISTERED LAND



1.3 NEED FOR PROPOSED ACTION ALTERNATIVE

National fire management policy has evolved in response to increased fatalities, property loss, local economic disruptions; risk to ecosystems associated with increasingly severe wildland fires; and increasing wildland urban interface (WUI) conflicts. National policy requires that federal fire management practices reflect protection of human life and safety, and reduce risks to natural resources and private property. Advances in scientific understanding of the role of fire in natural ecological processes should be incorporated into the management of fire across landscapes. Successful revision of the FMP would result in fire management direction that is compliant with national and interagency direction.

*Federal Wildland Fire Management Policy and Program Review (*USDI and USDA 1995) and *Review and Update of the 1995 Federal Wildland Fire Management Policy* (USDI and USDA 2001a) directed that FMPs be developed for all areas of burnable vegetation on federal lands. Management direction is further organized within the revised FMP through the use of land area subdivisions called fire management units (FMUs).

The revised FMP documents the fire management program and is based on existing Management Framework Plans (MFPs), Resource Management Plans (RMPs) and Planning Area Analysis (PA). Together, MFPs, RMPs and PA are more broadly known as land use plans (LUPs). FMPs are the fire manager's primary guide for planning, and in some instances, implementing fire-related direction on the ground. FMP incorporates the broader LUP management direction.

The revised FMP provides clear fire management direction compliant with national and interagency direction. The revised FMP would further the ultimate goals of improving firefighter and public safety, reducing fuel loads and maintaining the ecological functions of landscapes within the planning area.

1.4 PURPOSE OF THE PROPOSED ACTION ALTERNATIVE

The Director of the BLM's Office of Fire and Aviation has instructed all field offices to develop a new FMP or revise their existing FMP for all areas of burnable vegetation. The revised FMP should identify and integrate all federal wildland fire management guidance, direction, and activities required to implement national fire policy and program direction from the following: *Federal Wildland Fire Management Policy and Program Review* (USDI and USDA 1995), *Review and Update of the 1995 Federal Wildland Fire Management Policy* (USDI and USDA 2001a), *Interagency Strategy for Implementation of Federal Wildland Fire Management Policy* (BLM 2003a), and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-year Comprehensive Strategy Implementation Plan* (USDI and USDA 2001b).

Ecosystems have evolved with, and adapted to, specific fire regimes. Control and suppression of wildland fires have altered the natural frequencies, sizes, intensities and seasons of occurrence and have resulted in fuel loads, increases in understory and brush, and increases in stand density (Wright 1990, Covington and Moore 1994).

Two terms [fire regime (FR) and condition class (CC)] are used to describe natural fire processes and current departure from historic conditions. Fire regime is a description of natural fire return intervals associated with vegetation cover types (a further description of fire regime can be found in the glossary). CC is a description of vegetation conditions, based on the change from natural FR, including effects of fire suppression (fuel loading and encroachment) and species invasion. There are three condition class categories:

- Condition Class 1: Within historical range for fire return interval and vegetation attributes.
- Condition Class 2: Moderately altered from historical range.
- Condition Class 3: Substantially altered from historical range and vegetation attributes.

Wildland fire, as a critical and necessary ecological process, must be maintained in natural systems. Where wildland fire cannot be safely reintroduced because unnaturally high fuel loads present high risk to human life or property (as in many WUI areas), some form of hazardous fuels reduction must be considered. The objective of fuels reduction is to attain desired wildland fire conditions (DWFC). The general DWFC is to have ecosystems that are at a low risk of losing ecosystem components following wildfire and that function within their historical range.

The following underlying objectives drive the need to revise the Salt Lake FMP:

- Protection of human life would be the prime suppression priority. Setting priorities among protecting human communities and community infrastructures, other property and improvements, and natural and cultural resources would be based on the values to be protected, human health and safety, and costs.
- A wide range of fire management actions would be used to achieve ecosystem sustainability.
- Hazardous fuels would be reduced.
- Ecosystems would be restored.
- Communities at risk would be protected.

Acreages presented in the description of the Proposed Action Alternative are based on achieving these goals and objectives.

1.5 CONFORMANCE WITH BLM LAND USE PLANS

This proposed FMP EA was determined to be in conformance with SLFO's existing LUPs as amended in 1998. Additionally, this proposed FMP EA was determined to be in conformance with the Utah LUP Amendment for Fire and Fuels Management EA (US-EA-04-01). **Table 1.1** includes the relevant LUPs to which this FMP EA conforms. The Proposed Action Alternative would replace existing management goals, objectives, and management actions with current direction at the FMP level.

TABLE 1.1: OTHER RELEVANT BLM DOCUMENTS – SALT LAKE FIELD OFFICE

Land Use Plan	Year
Box Elder Resource Management Plan (RMP)	1986
Iso-tract Planning Area Analysis (PAA)	1985
Park City Management Framework Plan (MFP)	1975
Pony Express RMP	1990
Randolph MFP	1980

1.6 RELATIONSHIP TO STATUTES, REGULATIONS, OR OTHER PLANS

This document was prepared in adherence to relevant BLM NEPA and CEQ guidance for the completion of an EA. In addition to meeting the goals, objectives and intent of BLM planning guidance, other applicable fire management planning goals, policy statements and specific fire management decisions considered and addressed by the Proposed Action Alternative include:

- Federal Wildland Fire Management Policy (1995)
- Review and Update of the Federal Wildland Fire Management Policy (2001)

- A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: Ten-Year Comprehensive Strategy (2001)

Following CEQ and BLM guidance and fire management specific requirements, the Proposed Action Alternative considers and has been developed in compliance with other applicable environmental laws, policies and Executive Orders. These include (but are not limited to) the Healthy Forests Restoration Act; the Clean Air and Clean Water Acts; the Wild and Scenic Rivers Act; the Endangered Species Act; the National Historic Preservation Act; the Archaeological Resource Protection Act; and the Colorado River Basin Salinity Control Act; Utah air quality laws; and Native American Trust Resource Policies. Specific land management and wildland fire management legislation guiding this EA are shown in **Appendix B.**

The Proposed Action Alternative would be consistent with adjacent federal land agency, state of Utah and affiliated Native American Tribal planning. If inconsistencies are brought forward, the BLM would consider adjustments to fire and/or fuel treatments during implementation planning through coordination and cooperation with adjacent entities. Fire management would be as consistent as possible with the fire management strategies employed on adjacent lands (as administered by other federal, state and Native American Tribal authorities).

1.7 IDENTIFICATION OF ISSUES

The proposed FMP would not conflict with other resource goals and objectives in the existing LUPs. However, the potential for impacts on resources in the planning area raises issues that must be addressed by this EA. **Appendix A** presents the issues that were identified. These issues influenced the development of the Proposed Action Alternative. Those resources that are either not present within the planning area or would not be affected by the Proposed Action Alternative are identified in **Appendix A** and are not included for analysis in this document. This section presents a summary of potentially affected resource issues.

Issues Identified for Analysis

Cultural Resources (Including Native American Religious Concerns)

- Impacts on cultural sites.

Threatened, Endangered, or Candidate Plant Species

- Unplanned impacts on listed/candidate plant species and a potential to impact occupied habitat.

Threatened, Endangered, or Candidate Animal Species

- Unplanned impacts on listed/candidate animal species and a potential to impact occupied habitat.

Water Quality

- Impacts on water quality from unplanned actions.

Wetlands/Riparian Zones

- Short-term impacts on riparian areas, primarily vegetation conversion (loss, change, improvement, degradation).

Wilderness Study Areas

- Short-term impacts on naturalness, opportunities for solitude, and opportunities for primitive recreation in the wilderness study area (WSA).

Livestock Grazing

- Impacts on allotment use from loss of forage, conversion of vegetation, and threat to range improvements.

Woodland/Forestry

- Impacts on the availability of forest related products (including posts, fuel wood collection, etc.) and the availability of biomass.

Vegetation including Special Status Species

- Impacts on plant species, including special status species from fire and surface disturbing activities.

Fish & Wildlife including Special Status Species

- Impacts on fish and wildlife species, including special status species, and potential/occupied habitat including short-term displacement, disturbance, alteration of habitat, degradation, or loss of vegetation.

- Impacts on crucial seasonal habitat for moose, elk, deer, pronghorn, and sage grouse.

Soils

- Direct impacts from suppression including erosion/sedimentation, infiltration/runoff, and salinity/erosion.

Recreation

- Short-term impacts on developed recreation sites/facilities.

Socioeconomics

- Impacts on socioeconomics.

Wilderness Characteristics

- Short-term impacts on the naturalness, opportunity for solitude and primitive recreation, and any supplemental values of non-WSA lands with wilderness characteristics.

CHAPTER 2. DESCRIPTION OF ALTERNATIVES

2.1 INTRODUCTION

This chapter describes and compares the Proposed Action Alternative and No Action Alternative and addresses alternatives considered, but dismissed. The Proposed Action Alternative complies with Federal Wildland Fire Management Policy (1995, 2001) and incorporates issues identified during the scoping process (see Section 1.7 for these issues). The No Action Alternative represents current fire management direction as directed in the Salt Lake FMP Amendment (BLM 1998a).

The planning area boundary is identical for both alternatives. Under both alternatives, the planning area is divided into 44 units: the Proposed Action Alternative uses FMUs as the unit and the No Action Alternative uses "polygons" as the unit. Both Alternatives use the following fire management categories to describe polygons and FMUs:

- *Category A*: Wildland fire is not desired.
- *Category B*: Unplanned wildland fire is not desired, but prescribed fire and/or non-fire fuel treatments may be used to achieve resource objectives. Mitigation would likely be required to protect resources.
- *Category C*: Wildland fire is desired. Constraints are present to protect values at risk. Prescribed fire and non-fire fuel treatments may also be used to achieve resource objectives.
- *Category D*: Wildland fire is desired and there are no constraints associated with resource conditions, social, economic, or political considerations. [Note: Approximately 53 percent of lands in this category for both the Proposed Action Alternative and No Action Alternative fall in areas with no burnable vegetation (such as the Bonneville Salt Flats) and as such aren't available to wildland fire.]

The target acres for fire management direction in the No Action Alternative are compared with the target acres for the Proposed Action Alternative **Appendix D**. **Table 2.1** is a summary of this comparison of total BLM-administered acres for both alternatives by fire management category.

TABLE 2.1: FIRE MANAGEMENT CATEGORY COMPARISON

	Proposed Action Alternative	No Action Alternative
Category A	1,420,216	1,407,755
Category B	880,836	856,969
Category C	341,374	327,351
Category D	598,278	596,605

For wildland fire suppression, the differences between the No Action Alternative and Proposed Action Alternative are: Annual Burn Acreage Ceiling targets were assigned where there were no targets before, and overall there was an increase in the Ten Year Burn Acreage (**see Appendix D**).

For fire and non-fire fuels treatments, the total acres of treatments are similar between the No Action and Proposed Action Alternatives. The No Action Alternative doesn't differentiate between prescribed fire and non-fire fuel treatment acres; the Proposed Action defines separated adjusted targets for prescribed fire and non-fire fuel treatment acres. There is more focus on using mechanical treatments and seeding and much more focus on hazardous fuels treatments outside of or in the wildland-urban interface (WUI). In the No Action Alternative, the major fuel treatment method used was prescribed fire because of the ability to treat

more acres less expensively and the lack of available equipment for mechanical treatments. It should be noted that vegetation treatment locations in the Proposed Action Alternative have changed from the No Action Alternative due to alterations in vegetation since 1998 (i.e., some areas have converted to cheatgrass and prescribed fire would no longer be a viable treatment method). Lastly, fire regime (FR) and condition classes have been added to each FMU.

Appendix C presents a detailed definition of the fire management categories. **Appendix D** summarizes the differences in fire management action acreage goals by FMU between the No Action and Proposed Action Alternative. Greater detail regarding the alternatives is presented below.

2.2 PROPOSED ACTION ALTERNATIVE

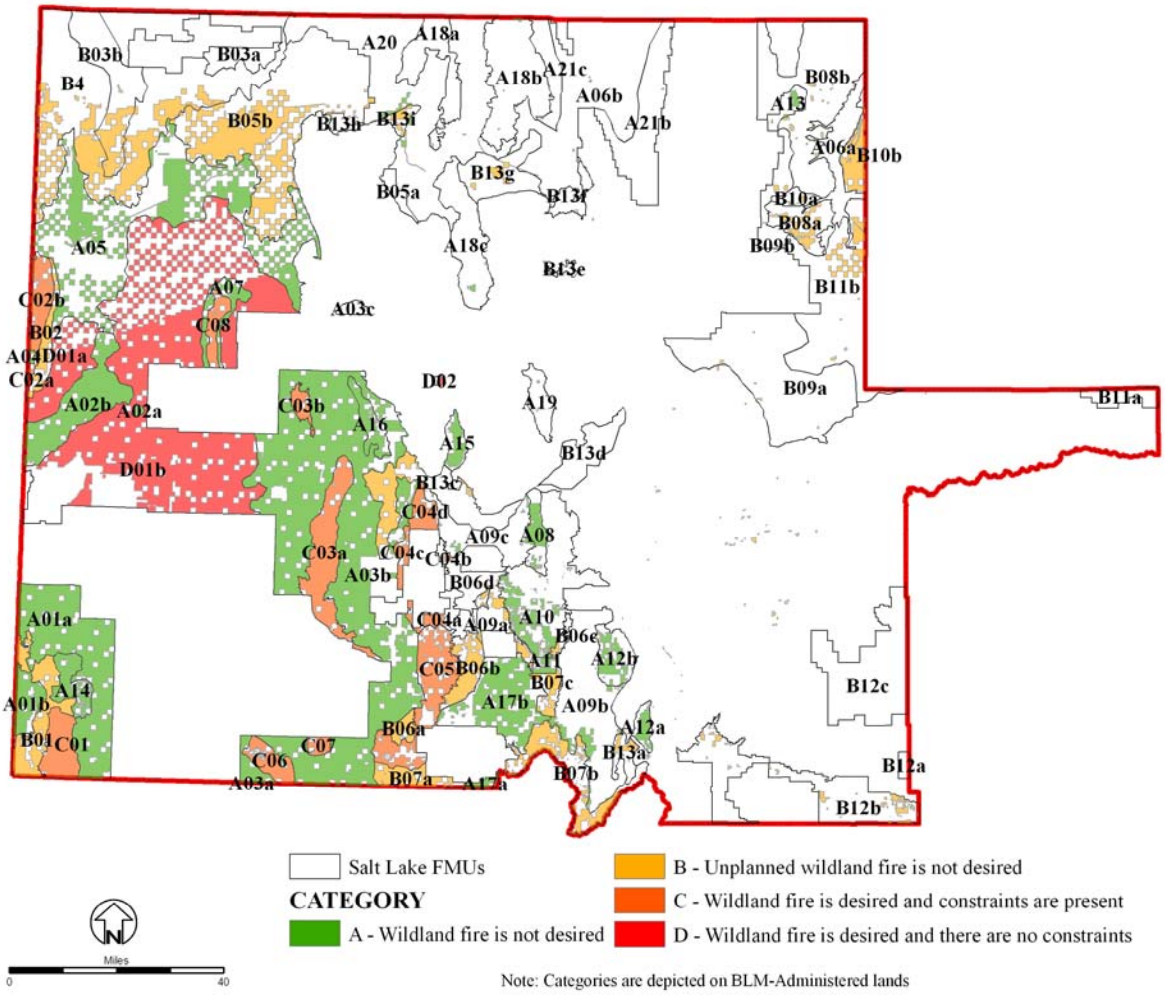
The 44 FMUs that make up the planning area for the Proposed Action Alternative and the fire management objectives for BLM-administered land are presented in Figure 2.1. Overall goals for the Proposed Action Alternative are discussed in Section 2.3.1, fire management actions are presented in Section 2.3.2, and RPMs are presented in Section 2. 3.3.

2.2.1 OVERALL GOALS

The Proposed Action Alternative emphasizes strategic fire management planning that integrates resource management goals, objectives, and concerns with fire management activities. Overall criteria for development of the Proposed Action Alternative are:

- Provide for firefighter and public safety.
- Work collaboratively with communities at risk within the WUI to develop plans for risk reduction.
- Allow fire to function in its ecological role, when appropriate for the site and situation, to help protect, maintain, and enhance public resources.
- Create an integrated approach to fire and resource management across landscape and agency boundaries.
- Provide a program that fosters interagency interaction, cooperation, and effectiveness for all fire management activities.

FIGURE 2.1: FIRE MANAGEMENT UNITS AND FIRE OBJECTIVES FOR THE PROPOSED ACTION ALTERNATIVE ON BLM-ADMINISTERED LAND



FMUs

A01-Elephant/Ibapah
A02-Floating & Silver Isles
A03-Skull Valley
A04-Donner/Bettridge
A05-Lucin/Red Dome
A06-Bear R
A07-Newfoundland
A08-N Oquirrh Mt
A09-Rush V
A10-S Oquirrh Mt
A11-Five Mile Pass
A12-Lake Mtn
A13-Laketown Cyn
A14-Gold Hill
A15-Stansbury Is
A16-Lakeside Mtn
A17-Rush V
A18-Hansel Mtn
A19-Antelope Is
A20-Curlew, Hansel, Blue
A21-Wasatch Fr
B01-Deep Cr/Clifton Fl
B02-Lower Pilot Mt
B03-Raft R Mt
B04-Semi Desert
B05-W Curlew/Matlin
B06-Davis Mtn
B07-S Simpson
B08-W Randolph
B09-Up Randolph
B10-Woodruff Cr
B11-Henry's Fk
B12-UpperElev
B13-WetLand
C01-N Deep Crk
C02-Pilot
C03-Cedar
C04-StansMt
C05-Onaqui
C06-Dugway
C07-Old River Bed
C08-Newfoundland
D01-Bonneville
D02-Carrington Is

2.2.2 FIRE MANAGEMENT ACTIONS FOR THE PROPOSED ACTION ALTERNATIVE

Three fire management actions are present in the Proposed Action Alternative: wildland fire suppression, prescribed fire, and non-fire fuel treatments. Wildland fire suppression is considered unplanned and does not undergo site-specific NEPA analysis due to unknown location, size, and timing of the event. Prescribed fire and non-fire fuel treatments are considered planned actions and must undergo site-specific NEPA review and analysis prior to implementation. Immediate actions (e.g., emergencies) surrounding wildland fire suppression are exempt from CEQ's regulatory provisions for implementing NEPA (40 CFR 1506.11). In the event of such emergencies, the BLM must consult with CEQ following direction in H-1790 and DOI Departmental Manual 516 (covering NEPA procedures).

Wildland Fire Suppression: Fire suppression goals stated in the Proposed Action Alternative are designed to protect resource values at risk while allowing wildland fire to function in its ecological role when appropriate for the site and situation. Priorities for a quick suppression response include: providing for public and firefighter safety, preventing wildland fires from spreading to private land, protecting cultural resources, riparian areas or other sensitive resources, and improvements on BLM lands. For any type of response, minimizing cost must be considered. The suppression objectives described in the FMUs outline the acreage per fire event to which wildland fires should be contained. Once the pre-defined 10 year burn target has been reached from unplanned ignitions, a review of objectives and strategies would be initiated to develop new suppression criteria on all wildland fires within that FMU.

Considerations for suppression objectives with target acres for FMUs are as follows:

- Fire intensity level
- Acreage of public/private land
- Level of public use
- Proximity to private residences, communities, and private in-holdings
- Historic fire regimes and current condition class
- Unique biological, cultural, historical, or archeological resources
- Potential for non-native species establishment

To meet suppression objectives, appropriate management response (AMR) procedures are required (BLM 2003b). An AMR is any specific fire suppression action suitable to meet FMU objectives (BLM 2003b). An AMR, included as part of the Proposed Action Alternative, may include one or more of the following actions:

- *Monitor from a Distance*: Fire situations where inactive fire behavior and low threats require only periodic monitoring.
- *Monitor On-site*: Fire situations that require the physical placement of monitors on the fire site to track the fire's spread, intensity, and/or characteristics.
- *Confinement*: Actions taken when fires are not likely to have resource benefits, but threats from the fire do not require costly deployment of large numbers of suppression resources.
- *Monitor plus Contingency*: Fires are monitored but contingency actions are prepared to ensure adequate preparation for possible undesirable developments.

- *Monitor plus Mitigation*: Fires are monitored, yet pose real, but not necessarily immediate, threats. These fires are monitored, but plans are developed and implemented to delay, direct, check fire spread, or contain fire, and to ensure public safety.
- *Initial Attack*: Initially, suppress wildland fires to protect people or resource values at risk.
- *Suppress Large Fires*: A combination of tactics such as direct attack, indirect attack, and confinement by natural barriers are utilized to accomplish protection objectives.
- *Control and Extinguish*: Actions taken using direct attack. Sufficient resources are assigned to achieve control of the fire minimizing acres burned.

In the aftermath of catastrophic wildland fires, emergency stabilization and post-fire rehabilitation (ESR) work would take place to improve lands that are unlikely to recover naturally from the effects of wildfires. Emergency stabilization treatments are essential to protecting lives and properties downstream of burned areas. ESR activities may include obliteration of firelines, erosion control, seeding and other administrative activities (closures & signs). ESR is only implemented after a wildland fire suppression event. ESR would be designed and implemented using an IDT approach, utilizing resource and fire staff to develop site-specific ESR plans. The short-term ESR objective would be to stabilize soils, reduce potential impacts on values at risk (cultural, watershed, fish and wildlife, and any adjacent private holdings), and prevent the establishment of nonnative invasive species. Long-term objectives include further stabilization of sites to assist in the re-establishment of the vegetative community that existed prior to the disturbance.

***Prescribed Fire*:** Prescribed fire would be implemented to achieve DWFC objectives. Prescribed fire would be considered for an FMU if it could benefit ecosystems and reduce hazardous fuels. Suitability of specific areas for prescribed fires would be determined through an interdisciplinary process. NEPA requirements must be followed for site-specific prescribed fire projects.

Prescribed burn season typically occurs between March 1 and May 15 and September 1 and October 30. Hand pile burning would usually occur in the winter months (November through February). The fire management staff would initiate prescribed fire projects and burn plans with input from resource specialists. Prescribed burn bosses would be required to evaluate and assess results and effectiveness of the burn.

Prescribed fire may be used for any of the following purposes:

- Fuels reduction
- Conversion of condition class 3 lands to condition class 1 or 2 lands
- Conversion of condition class 2 to condition class 1 lands
- Maintenance of condition class 1 lands

***Non-fire Fuel Treatments*:** Non-fire fuel treatments (mechanical, biological, seeding and chemical) may be considered to achieve DWFC objectives and reduce hazardous fuels. Suitability of specific areas would be determined through an interdisciplinary process and NEPA requirements must be followed. Non-fire fuel treatments may include hand thinning, hand piling, brush crunching, mowing, disking, chipping, and bullhog thinning. Seeding can be a component of prescribed fire and non-fire fuel treatments (mechanical, biological, and chemical). As technology advances, other methods may be utilized. Many FMUs have acreage targets for non-fire fuel treatments. While the remaining FMUs may not have target acres, future treatment plans would be prepared to implement those actions. Some non-fire fuel treatments would be used in conjunction with prescribed fire.

Seeding may follow prescribed and non-fire management actions. The purpose of seeding would be to promote the re-establishment and perpetuation of habitat diversity, and prevention or reduction of invasive

weed species. Seeding efforts would be selectively applied to planned management actions and would be covered under site-specific NEPA review. ESR is considered a part of wildland fire and is considered separately from standard seeding.

2.2.3 RESOURCE PROTECTION MEASURES

The Proposed Action Alternative potentially could impact other resources. To prevent such impacts, resource protection measures have been incorporated into the Proposed Action Alternative as presented in **Appendix E**.

2.3 NO ACTION ALTERNATIVE

The current Salt Lake FMP Amendment (BLM 1998a) comprises the No Action Alternative. Like the Proposed Action Alternative, the No Action Alternative uses a wide range of fire management actions to allow fire to play a more natural role in the ecosystem, while prioritizing human safety above all else. It followed the most current science and federal and state guidelines at the time it was approved. **Figure 2.2** illustrates fire management objectives for the No Action Alternative on BLM-administered land.

Although the No Action Alternative has three of the same goals as the Proposed Action Alternative—protection of life, protection of resources, and cost efficiency—it does not fully incorporate the idea of fire as an ecological process, hazardous fuel treatments to protect communities and other values at risk, and landscape determinations of fire regime condition class.

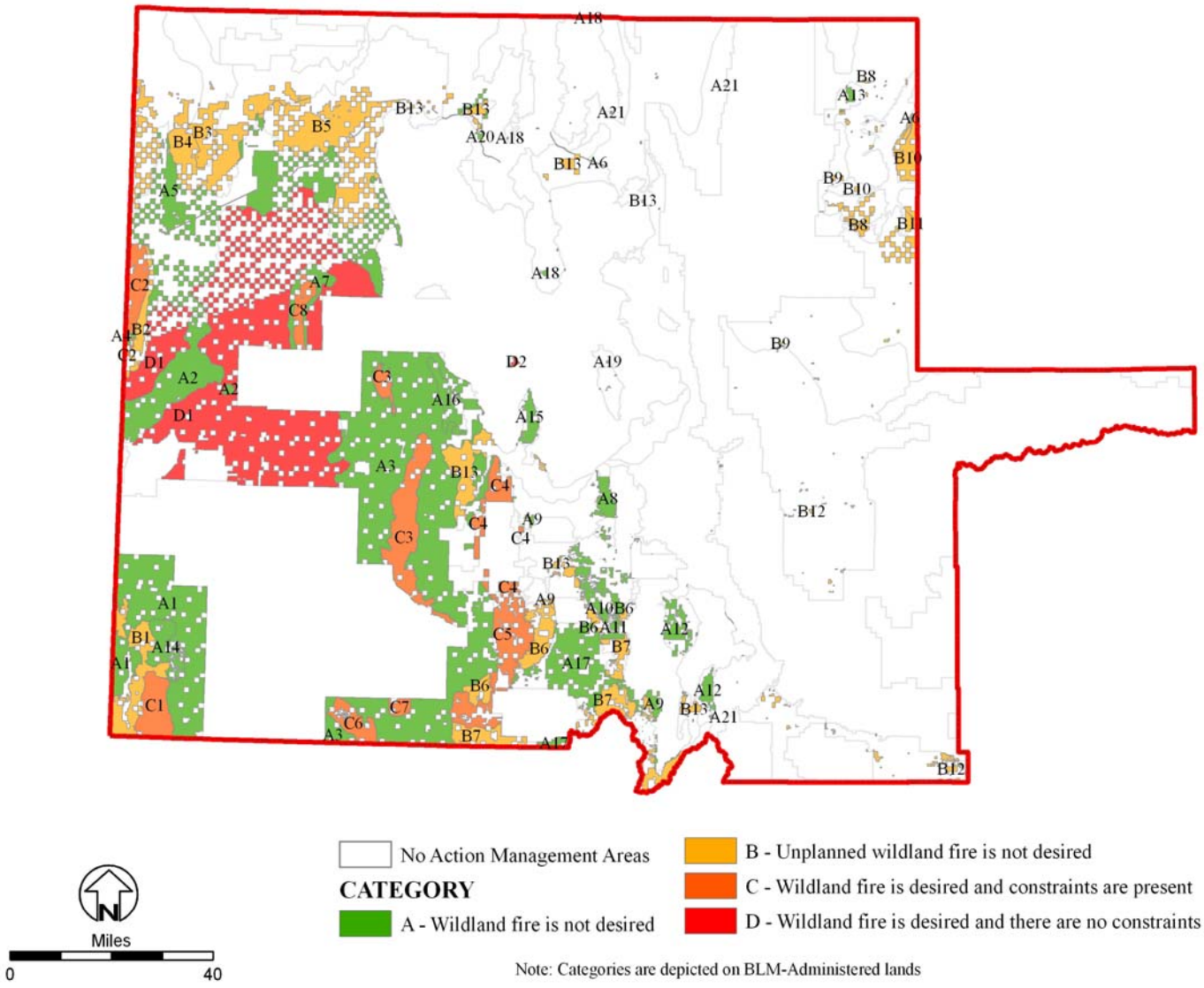
2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

Two additional fire management alternatives, the Historical Fire Alternative and the Non-Fire Treatment Alternative, were considered but eliminated from formal analysis because they either did not meet policy guidelines or they were not ecologically or fiscally practical. The two dismissed alternatives are described below.

2.4.1 HISTORICAL FIRE ALTERNATIVE

An additional fire management alternative was considered but eliminated from formal analysis because it would not be ecologically or fiscally feasible. This alternative would be referred to as the Historical Fire Alternative as it sets treatment targets that mimic acres burned historically, while considering the restoration of natural FR. These acreages were determined from simple vegetation and fire return interval analysis. The primary distinctions between this alternative and the Proposed Action Alternative are the differences in treatment acres and types to achieve DWFC; this alternative would include larger treatment acres than the Proposed Action Alternative, and only fire treatments would be employed.

FIGURE 2.2: FIRE MANAGEMENT OBJECTIVES FOR THE NO ACTION ALTERNATIVE ON BLM-ADMINISTERED LAND



Polygons

A01-Elephant/Ibapah
A02-Floating & Silver Isles
A03-Skull Valley
A04-Donner/Bettridge
A05-Lucin/Red Dome
A06-Bear R
A07-Newfoundland
A08-N Oquirrh Mt
A09-Rush V
A10-S Oquirrh Mt
A11-Five Mile Pass
A12-Lake Mtn
A13-Laketown Cyn
A14-Gold Hill
A15-Stansbury Is
A16-Lakeside Mtn
A17-Rush V
A18-Hansel Mtn
A19-Antelope Is
A20-Curlew, Hansel, Blue
A21-Wasatch Fr
B01-Deep Cr/Clifton Fl
B02-Lower Pilot Mt
B03-Raft R Mt
B04-Semi Desert
B05-W Curlew/Matlin
B06-Davis Mtn
B07-S Simpson
B08-W Randolph
B09-Up Randolph
B10-Woodruff Cr
B11-Henry's Fk
B12-UpperElev
B13-WetLand
C01-N Deep Crk
C02-Pilot
C03-Cedar
C04-StansMt
C05-Onaqui
C06-Dugway
C07-Old River Bed
C08-Newfoundland
D01-Bonneville
D02-Carrington Is

TABLE 2.2: ESTIMATED HISTORICAL ACRES BURNED OVER TEN-YEAR PERIOD

Land Use Plan	Acres
Box Elder RMP	205,860
Iso-Tract PAA	0*
Park City MFP	30
Pony Express RMP	453,405
Randolph MFP	69,345
TOTAL	***728,640***

*No figures were determined for Iso-Tract due to its small size and disjointed planning area

The premise on which the development of this alternative was based is that restoration of natural fire regime is desirable and attainable. This premise is faulty in that, as a result of past management and the extent of anthropogenic ecosystem alteration, natural conditions no longer occur in the planning area. While it is known that there have been vegetation alterations since historical times, the extent or severity of most of these alterations remains uncertain. As a result of ecosystem change, passive restoration techniques, such as restoring naturally occurring fires to the land, would not have the same benefit to ecosystems as in the past.

The BLM manages scattered parcels of land in many areas; allowing fires to burn in these multiple-ownership areas would increase risk to private and state lands. Finally, this alternative is unlikely to be adequately funded. Despite increases in fire management funding over the past five years, current and expected budgets for implementing fire management actions do not provide the necessary resources for accomplishing the identified treatment acres.

2.4.2 NON-FIRE TREATMENT ALTERNATIVE

Another alternative considered would have prioritized non-fire fuel treatments above other types of treatments. Non-fire fuel treatments have been analyzed in the Proposed Action Alternative as part of the suite of fire management actions used to achieve ecosystem and protection objectives. However, the sole use of non-fire fuel treatments did not meet the Purpose and Need and was therefore eliminated from further analysis. The Federal Wildland Fire Policy directs that fire be restored as a natural part of the ecosystem.

CHAPTER 3. AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter includes a description of the environment and resources that have potential to be affected by the alternatives described in Chapter 2. Environmental resource baseline information is presented for comparing potential impacts from the Proposed Action Alternative and No Action Alternative, which are analyzed in Chapter 4. Environmental resource information on the general effects fire has on each resource, not solely attributable to management actions, is presented in **Appendix F**.

Identified resources carried forward for analysis in this planning effort and those dismissed from further analysis, are also addressed in **Appendix A**. The following resources may be affected and are discussed in Chapters 3 and 4:

- Cultural Resources
- Threatened, Endangered or Candidate Species – Plants
- Threatened, Endangered or Candidate Species – Animals
- Water Quality (Drinking / Ground)
- Wetlands / Riparian Zones
- Wilderness / Wilderness Study Areas
- Livestock Grazing
- Woodland / Forestry
- Vegetation including Special Status Species
- Fish & Wildlife including Special Status Species
- Soils
- Recreation
- Wilderness Characteristics

3.2 GENERAL SETTING

The Salt Lake planning area is located within portions of the Basin and Range and Rocky Mountain physiographic provinces of the western United States. Elevations in the planning area range from 4,200 to over 13,000 feet above mean sea level. Most of the planning area is located between 4,200 to 8,000 feet above sea level. Utah's population is approximately 2,300,000 (2002 estimates from the Utah Office of Planning and Budget). Approximately 2,000,000 of these people (86 percent of Utah's population) live within the SLFO boundary (Mathews 2005).

Climatic zones throughout the region can be classified as four climate types—desert, steppe, humid continental, and undifferentiated highlands. Each has distinct weather patterns, temperatures, and precipitation patterns (Pope and Brough 1996). Elevation, topography, location with respect to storm paths over the region and proximity to mountain ranges help create the varied climate types (Garwood 1996). Precipitation within the planning area varies from an average of less than seven inches per year to more than 25 inches per year.

The planning area is comprised of approximately 3.2 million acres of BLM-administered lands. This represents approximately six percent of all lands in Utah and 14 percent of BLM-administered land in Utah.

3.3 CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT AND OTHER RESOURCES BROUGHT FORWARD FOR ANALYSIS

3.3.1 CULTURAL RESOURCES (Including Native American Religious Concerns)

Cultural resources are prehistoric or historic locations where human habitation or use has occurred. These include archaeological, historic, and architectural sites that are important for scientific research or for public display through preservation and interpretative efforts. Resources include traditional cultural properties and religious sites that are important to Native American and other cultural groups. A number of legislative acts and Executive Orders (EOs) provide procedures and guidelines for federal agencies to follow to determine

affects of their projects on cultural resources. This includes the National Historic Preservation Act (NHPA), as amended; American Religious Freedom Act; Archaeological Resources Protection Act; and EO 13007 (Indian Sacred Sites).

Section 106 of the NHPA and its implementing regulations (36 CFR 800) require federal agencies to take into account the effects of their undertakings on historic properties. According to these regulations, a historic property is defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places" (36 CFR 800.14). This definition also encompasses artifacts, records, and remains related to such properties. Compliance with Section 106 of the NHPA would be completed on a project-specific basis before planned actions are implemented.

The following provides a general overview of the wide range of prehistoric and historic sites that occur on BLM-managed land in the SLFO. There is one ACEC designated for cultural/historic values (the Central Pacific Railroad Grade). The SLFO also has eight National Register of Historic Places (NRHP) listings, segments of two Congressionally Designated National Historic trails (the California Trail and the Pony Express/Stagecoach Overland Trail). The following are the NRHP properties:

- Central Pacific Railroad Grade
- Pony Express/Overland Stage National Historic Trail
- California Trail, including Hastings Cutoff, Bartleson-Bidwell Trail, and Salt Lake or Henley Cutoff
- Lincoln Highway
- Lower Bear River Archaeological District
- Wendover Air Force Base
- GAPA Launch Site and Blockhouse
- Iosepa Settlement Cemetery

The BLM's existing LUPs describe cultural site types and general distribution of the sites throughout the individual planning areas. It is important to note that such locations represent known sites only and may not represent all sites, given that cultural resource surveys have been completed on only relatively small portions of the planning areas.

Prehistoric Resources

Thousands of archaeological sites representing more than 13,000 years of human occupation have been recorded on BLM-managed land in the planning area. Prehistoric sites are usually concentrated near seeps and springs in desert mountain ranges, along perennial mountain streams, and along rivers. Typical sites include rock shelters (such as Lakeside Cave), hunting camps, lithic scatters, obsidian and other lithic sources, and rock art.

Historic Resources

Historic resources in the Salt Lake planning area pertain primarily to exploration, migration, and transportation routes, as well as mining, ranching, and military activities. These activities began as early as 1776 with the Dominguez and Escalante expedition, which dates to the period of Spanish/Mexican exploration. Fur trappers entered the area in the 1820s and sporadically used the area for hunting, rendezvous, and caching furs. The first permanent Euro-American settlers arrived in the area in 1847. Historic sites in the planning area include ghost towns, historic ranches, mining sites, and numerous historic trails and wagon trails. Segments of two Congressionally Designated National Historic Trails (the California Trail and the Pony Express/Stagecoach Overland Trail) are present. BLM manages a number of locations as

interpretative sites along the Pony Express and Overland Stage Line, such as Canyon Station and Simpson Springs. The Hastings Cutoff, the Bidwell-Bartleson Trail, the Salt Lake Cutoff, the Midland Trail, and the Lincoln and Victory Highways also traverse the region. Numerous mining "ghost towns" and other abandoned settlements occur throughout the area, such as Ophir, Mecur, and Tintic.

Many resources, such as the National Register-listed Transcontinental Railroad Corridor and its associated features consisting of trestles, culverts, sidings, and construction camps, are considered historically significant and are mostly accessible to the public. The Central Pacific Grade is considered an ACEC. Another area of historic importance is the Pilot Range, which contains a historic mining tram, mined areas, and a number of historic trails. The desert ranges and mudflats have been used by the military since World War II for bombing and strafing ranges, as well as emergency landing fields, gunnery training ranges, missile test areas, and other military training and test sites. Roads, structures, and work camps constructed by the Civilian Conservation Corps are also present.

3.3.2 SPECIAL STATUS SPECIES

For purposes of this EA, special status species were divided into two types: ESA-related species and BLM sensitive species.

ESA-related species include those listed as endangered and threatened under the ESA of 1973 (as amended), as well as candidate and petitioned species (**Appendix G**). Threatened and endangered species are under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS). Candidate and petitioned species are not under the jurisdiction of the USFWS; however, because they are given recognition as candidates or species petitioned for federal listing, they are discussed under the ESA-related heading.

The eleven ESA-related species occurring in the Salt Lake planning area are described in **Appendix G**. The June sucker (a federally-listed fish species), is the only species with designated critical habitat in the southeast corner of the planning area. It is noted that the black-footed ferret, although considered to be extirpated from the Salt Lake planning area, is found within neighboring Utah counties. An experimental, non-essential population [ESA, Section 10(j)] of the ferret has been established with a designated 10(j) use area in two counties with lands administered by the Vernal Field Office. Within the designated use area, the ferret is considered by BLM management authorities to have a status equivalent to the federal listing status of "proposed." If individual ferrets were to venture outside of the designated use area and into the Salt Lake planning area, they would be considered endangered and the appropriate management regulations would apply.

BLM sensitive species include certain animal and plant species, some of which may be managed through conservation agreements in which BLM participates. The 46 BLM sensitive species in the planning area are listed in **Appendix H.**

Species Habitat

Habitats associated with each special status species, and the distribution of such habitats, are widely variable. Some species are found throughout the Salt Lake planning area while others are endemic to a single location. As noted above, Utah GAP (see sidebar) was used to identify vegetative cover types pertaining to this project. Utah GAP provides an indicator of vegetation coverage and habitat types at the large scale, but is not usually adequate on the ground for site-specific projects. Consequently,

Gap Analysis Program (GAP)

GAP is a scientific method for identifying the degree to which natural communities are represented. Vegetation is mapped from satellite imagery and other records using the National Vegetation Classification System.

the expanse (acreage or boundary) of a cover type may be different when compared to site-specific analysis.

Major vegetation cover types identified within the Salt Lake planning area include salt desert shrub, pinyon and juniper woodland, sagebrush, mountain shrub, and mixed conifer. These vegetation cover types, and their distribution on BLM-administered lands throughout the planning area, are described in the vegetation section of this chapter (3.3.8). Other vegetation types within the planning area comprising relatively small acreages include grassland, riparian/wetland, and aspen. Because water is a valuable habitat and has the potential to be impacted by the proposed project, it is presented in this EA as a habitat type. **Table 3.1** presents special status species (split into ESA-related and BLM sensitive species) generally associated with each of the nine vegetation communities/habitat types within the Salt Lake planning area. These vegetation types are subsets of the major vegetation types shown in the Vegetation resource section in Chapter 3. For example, grasslands are present in salt desert shrub and sagebrush communities. Special status plant species are not necessarily associated with vegetation community types, but are more closely associated with substrate type. Therefore, plant species listed in the vegetation community associations below do not infer an actual association, but rather indicate the vegetation community surrounding each plant species. **Appendices G** and **H** present associated substrates for each plant species.

TABLE 3.1: VEGETATION TYPES AND ASSOCIATED SPECIAL STATUS SPECIES

Vegetation Type	Endangered Species Act-related Species	BLM Sensitive Species
Salt Desert Shrub	None	Pohl's milk-vetch, small spring parsley, spotted bat, fringed myotis, and kit fox.
Pinyon and Juniper Woodland	Goose Creek milk-vetch.	Small spring parsley, Kass rockcress, Idaho penstemon, Lewis's woodpecker, fringed myotis, and Eureka mountainsnail.
Sagebrush	Goose Creek milk-vetch, bald eagle, black-footed ferret, white-tailed prairie dog, and pygmy rabbit	Pohl's milk-vetch, small spring parsley, Idaho penstemon, ferruginous hawk, greater sage grouse, dark kangaroo mouse, Eureka mountainsnail, Lyrate mountainsnail, and smooth greensnake
Grassland	Black-footed ferret.	Grouse Creek arabis, grasshopper sparrow, short-eared owl, burrowing owl, ferruginous hawk, long-billed curlew, sharp-tailed grouse, and Eureka mountainsnail.
Mountain Shrub	None	Black swift.
Mixed Conifer	Bald eagle and Canada lynx	Kass rockcress, Deep Creek stickseed, Cottam cinquefoil, rock violet, northern goshawk, black swift, Lewis's woodpecker, three-toed woodpecker, Townsend's big-eared bat, spotted bat, western red bat, fringed myotis, Eureka mountainsnail, and boreal toad.
Riparian/Wetland	Ute ladies'-tresses, bald eagle, Western yellow-billed cuckoo, and fat-whorled pondsnail	Northern goshawk, black swift, bobolink, Lewis's woodpecker, American white pelican, Preble's shrew, western red bat, Utah physa, Bear Lake springsnail, southern Bonneville pyrg, northwest Bonneville pyrg, California floater, western pearlshell, boreal toad, and smooth greensnake.
Aspen	None	Rock violet, black swift, three-toed woodpecker, and Eureka mountainsnail.
Water	June sucker and Lahontan cutthroat trout	Bonneville cutthroat trout, Colorado River cutthroat trout, least chub, leatherside chub, roundtail chub, bluehead sucker, flannelmouth sucker, and Yellowstone cutthroat trout.

3.3.3 WATER QUALITY

Watersheds, aquifers, rivers, and streams are ecologically dynamic interfaces of atmosphere, soils, and water. Healthy watersheds capture precipitation and runoff, store water in the soil (or bedrock) profile, and release it slowly back into surface waters. Most of the water supply to the watersheds within the Salt Lake planning area comes from snowmelt during the spring and early summer months and precipitation from high-intensity convective storms throughout the spring, summer, and fall. There are also many ephemeral drainages present throughout the watersheds within the planning area that flow intermittently during the year.

The discussion regarding water quality has been divided into characterizations of surface water and groundwater resources within the planning area.

Surface Water

The major watershed management units identified in the Salt Lake planning area are the Bear River, Weber River, and Jordan River, and portions of the Uinta Basin, Colorado River West, Sevier River, Great Salt Lake Desert, and Columbia River (UDEQ 2005a). Major rivers within the planning area include the Bear, Weber, Ogden, Jordan, and Provo Rivers. Surface water within the planning area is used for domestic, recreational, aesthetic, agricultural, stock-watering, and industrial purposes. Surface waters are also habitat for aquatic and water-oriented wildlife and fish.

The Federal Water Pollution Control Act of 1972 and the Clean Water Act (CWA) of 1977 and subsequent amendments/revisions are the predominant federal legislation that directs management of water quality on BLM-administered lands. The CWA mandates restoration and/or maintenance of the chemical, physical, and biological integrity of our nation's waters, and dictates further compliance to state and local water quality standards. In the Salt Lake planning area, BLM must also comply with Utah Department of Environmental Quality (UDEQ) water quality standards.

Under Section 303(d) of the CWA, UDEQ is directed to list all waters that do not meet water quality standards or have impaired beneficial uses (e.g., drinking water, recreation, etc.). Waterbodies in which water quality is impaired are referred to as "303(d)-listed streams" or "impaired waters." The sources of these impairments come predominantly from agriculture (e.g., grazing, irrigation), natural sources (e.g., bedrock), on-the-ground hydrological modification (e.g., resource extraction and road construction), and point-source discharges. When a stream is listed as impaired, the allowable total maximum daily load (TMDL) of a pollutant, such as total dissolved solids, is required to be calculated for the stream.

UDEQ Division of Water Quality has identified 14 waterbodies within the planning area as 303(d)-listed streams, reservoirs and lakes, totaling approximately 261 miles of streams or rivers (UDEQ 2004) (**Figure 3.1**). TMDL determinations have been completed for 303(d)-listed sections of the Clarkston Creek, Newton Reservoir, Newton Creek, Deer Creek Reservoir, East Canyon Creek and Reservoir, Hyrum Reservoir, Little Bear River, Little Cottonwood Creek, Lower Bear River, Mantua Reservoir, Pineview Reservoir, Silver Creek, and Spring Creek (UDEQ 2005b). The agency is currently completing additional TMDL analyses of the 303(d)-listed sections on the other waterbodies in the planning area. Waterbodies are added/removed, as such; this list (above) would be modified/updated by the agency.

Groundwater

The primary groundwater recharge areas in Utah generally occur along mountain fronts where basin-fill materials erode from mountain bedrock. Groundwater accumulates in these areas and moves down-gradient, usually toward the valley bottoms. Further away from the mountain fronts, groundwater discharge areas occur where groundwater collects (e.g., to form playas) or enters surface waterbodies. Groundwater

recharge areas could be particularly vulnerable to surface sources of pollution because the primary recharge areas may not have protective, fine-grained layers (such as typically found in basin valleys) that serve to filter out the pollutants as the fluids move downward. Groundwater is part of the developed water supply for numerous municipalities in the Salt Lake planning area and supplies private water wells used for drinking water and irrigation.

Wetlands and Riparian Zones

A riparian area is generally defined as the area alongside a perennial or ephemeral stream that is influenced by the presence of shallow groundwater. The U.S. Army Corps of Engineers (Federal Register 1982) and the U.S. Environmental Protection Agency (EPA) (Federal Register 1980) jointly define wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and which, under normal circumstance do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. BLM Manual 1737 (USDI 1992), *Riparian and Wetland Area Management*, includes marshes, shallow swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas as wetlands.

Riparian and wetland area soils, vegetation, and hydrology vary as a result of many factors. Because of this, riparian and wetland habitats are grouped into two major categories: 1) lentic, which is standing water habitat such as lakes, ponds, seeps, bogs, and meadows, and 2) lotic, which is running water habitat such as rivers, streams, and springs. Both lentic and lotic habitats are found within the Salt Lake planning area (BLM 1999). Wetland and riparian vegetation communities are illustrated in **Figure 3.4**.

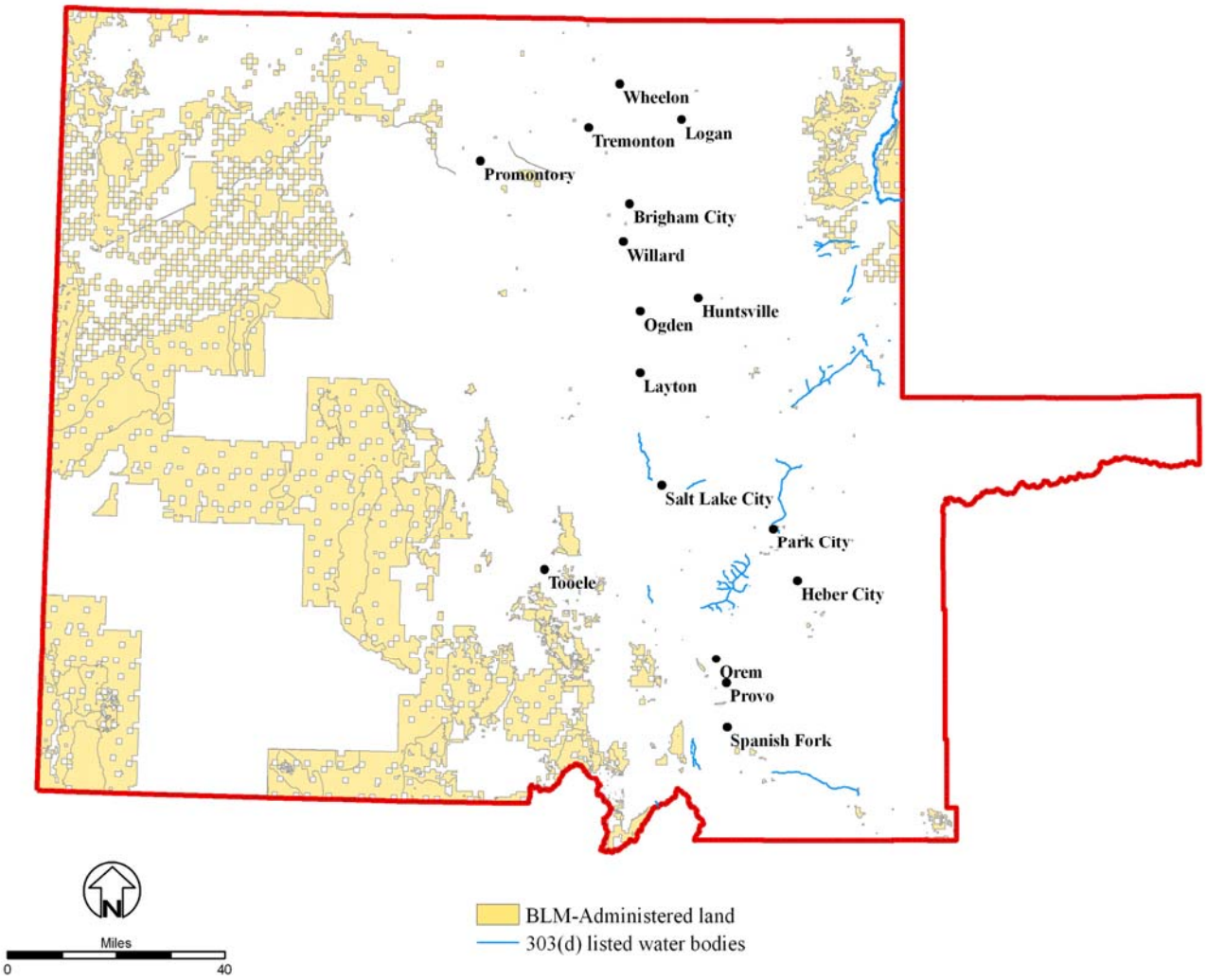
TR1737-16, 1999 suggests that lentic riparian/wetland areas are functioning properly when adequate vegetation, landform, or debris is present to:

- Dissipate energies associated with wind action, wave action, and overland flow from adjacent sites, thereby reducing erosion and improving water quality.
- Filter sediment and aid floodplain development.
- Improve flood-water retention and ground-water recharge.
- Develop root masses that stabilize islands and shoreline features against cutting action.
- Restrict water percolation.
- Develop diverse ponding characteristics to provide the habitat and water depth, duration, and temperature necessary for fish production, water-bird breeding, and other uses.
- Support greater biodiversity.

BLM (1998b) suggests a lotic riparian/wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to:

- Dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality.
- Filter sediment, capture bedload, and aid floodplain development.
- Improve flood-water retention and ground-water recharge.
- Develop root masses that stabilize streambanks against cutting action.
- Develop root masses that stabilize streambanks against cutting action.
- Develop diverse ponding and channel characteristics to provide the habitat and water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses.
- Support greater biodiversity.

FIGURE 3.1: 303(D)-LISTED WATERBODIES IN THE SALT LAKE PLANNING AREA



If a riparian and wetland area is not in a properly functioning condition (PFC), the area is placed into one of three other categories:

Functional-at-Risk: Riparian and wetland areas that are in functional condition but have an existing soil, water, or vegetation attribute that makes them susceptible to degradation.

Non-Functional: Riparian and wetland areas that clearly are not providing adequate vegetation, landform, or woody debris to dissipate energies associated with flow events, and thus are not reducing erosion, improving water quality, etc.

Unknown: Riparian and wetland areas for which there is a lack of sufficient information to make any form of determination (BLM 1994).

Within the Salt Lake planning area, the following riparian or wetland areas have been identified in the LUPs as exhibiting important values.

- Bear River
- Deep Creek
- Donner Creek
- Bettridge Creek
- Laketown Creek/Canyon
- Great Salt Lake
- Rush Lake
- Utah Lake
- Powell Slough
- Salt Wells Wildlife Habitat Area (WHA)
- Blue Springs WHA
- Horseshoe Springs WHA

The functioning condition and the natural processes that affect functionality of wetlands and riparian areas have been impaired at many locations through human disturbances and alterations and infestation of non-native plant species. Humans have altered stream aquatic and riparian environments by direct modifications (channeling, wood removal, diversion, dam-building, irrigation de-watering) and indirect impacts (from timber harvest, mining, grazing, and road building). These activities have altered channels by changing the rate at which sediment, water, and wood enter and are moved through streams. Human activities have also affected the incidence, frequency, and magnitude of natural disturbance events (McIntosh et al. 1991).

Salt Lake Field Office Wetland and Riparian Functioning	
Riparian Area	**Reach #/Length/Function**
Bear River	Reach 1 (.67 Mile) – Functional At-Risk
Deep Creek	Reach 1 (9 miles) – Functional At-Risk Downward
Donner Creek	Reach 1 (.05 miles) – Proper Functional Condition Reach 2 (.20 miles) – Proper Functional Condition Reach 3 (.25 miles) – Functional At-Risk Upward
Bettridge Creek	Reach 1 (.50 miles) – Functional At-Risk Upward Reach 2 (.25 miles) – Functional At-Risk Upward
Laketown Creek/Canyon	Reach A (1 miles) – Functional At-Risk Downward Reach B (.05 miles) – Functional At-Risk Downward Reach C (.75 miles) – Functional At-Risk Downward Reach D (.05 miles) – Proper Functional Condition Reach E (.05 miles) – Proper Functional Condition Reach F (.75 miles) – Proper Functional Condition
Great Salt Lake	No PFC data has been collected on Great Salt Lake
Rush Lake	Lentic Area A (4.84 Acres) – Proper Functional Condition
Utah Lake	Lentic Area A (40 Acres) – Proper Functional Condition Lentic Area B (8 Acres) – Proper Functional Condition
Powell Slough	No PFC Data has been collected on Powell Slough
Salt Wells Wildlife Habitat Area (WHA)	Lentic Area A (1,040 Acres) – Functional At-Risk Upward
Blue Springs WHA	Lentic Area A (1,730 Acres) – Functional At-Risk Upward
Horseshoe Springs WHA	Lentic Area A (12.12 Acres) – Proper Functional Condition

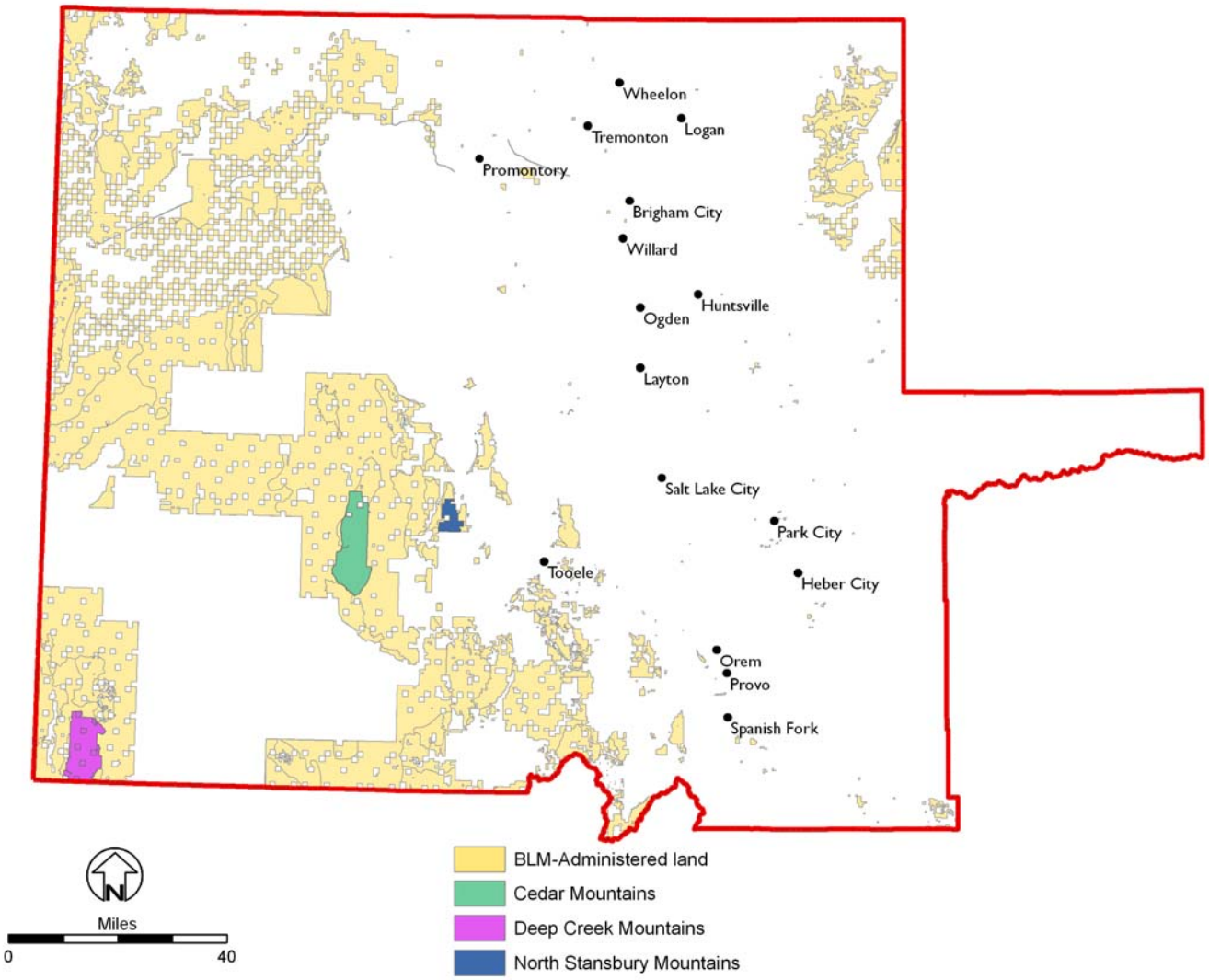
3.3.4 WILDERNESS STUDY AREAS

The Wilderness Act of 1964 (16 U.S.C. 1131-1136, 78 Stat. 890) established the National Wilderness Preservation System and established guidelines for the designation and management of wilderness. Wilderness areas can only be designated by Congress, and are managed under the Wilderness Act. There are no designated wilderness areas in the Salt Lake planning area. A Wilderness Study Area (WSA) is an administrative designation designed to allow areas to be studied and considered by Congress for possible designation as wilderness. WSAs are managed to prevent impairment of their suitability for Congressional designation as wilderness.

BLM-administered WSAs are managed for multiple uses including non-motorized and non-mechanized recreation; viewing of archaeological and historical sites; livestock grazing in areas where was allotments were established prior to WSA designation; protection of watersheds; and habitat for wildlife. Private individuals may have authority to exercise prior valid existing rights such as water rights, mining claims, mineral leases, and rights-of-way in WSAs.

By policy, management of WSAs is generally less restrictive than management of Wilderness Areas, but activities that would impair wilderness suitability are prohibited. FLPMA requires the BLM to protect the wilderness character of each WSA until Congress makes its decision. There are approximately 110,035 acres that have been designated for WSAs within the Salt Lake planning area. Locations of WSAs are shown on **Figure 3.2**.

FIGURE 3.2: WILDERNESS STUDY AREAS IN THE SALT LAKE PLANNING AREA



3.3.5 LIVESTOCK GRAZING

Allotments

Grazing allotments are geographically unique parcels that range in size from tens of thousands of acres to small isolated parcels of public land of less than one acre. The size of the allotment affects how the units are managed. Allotments with large blocks of contiguous BLM land are minimally impacted by surrounding private land. Isolated tracts are often a small component of a larger private land holding. Administrative access to these small tracts of public land sometimes exists only because of the grazing permit or lease. Allotments may be joined with private, state, other federal lands or a combination thereof, in addition to BLM-administered lands. Allotments may be permitted to one (individual allotment) or more (common allotment) operators. More than one permit may be issued to a particular individual or company.

Grazing use by livestock is measured in terms of animal unit months (AUMs). One AUM is equal to the amount of forage used to support one cow and calf for one month (approximately 800 pounds of forage). Grazing permits convey no right, title, or interest in the public lands and their resources.

Livestock grazing is permitted on approximately 82 percent (approximately 2.6 million acres) of BLM-administered lands in the Salt Lake planning area. For administrative purposes, the Salt Lake planning area is divided into 153 grazing allotments (**Figure 3.3)**.

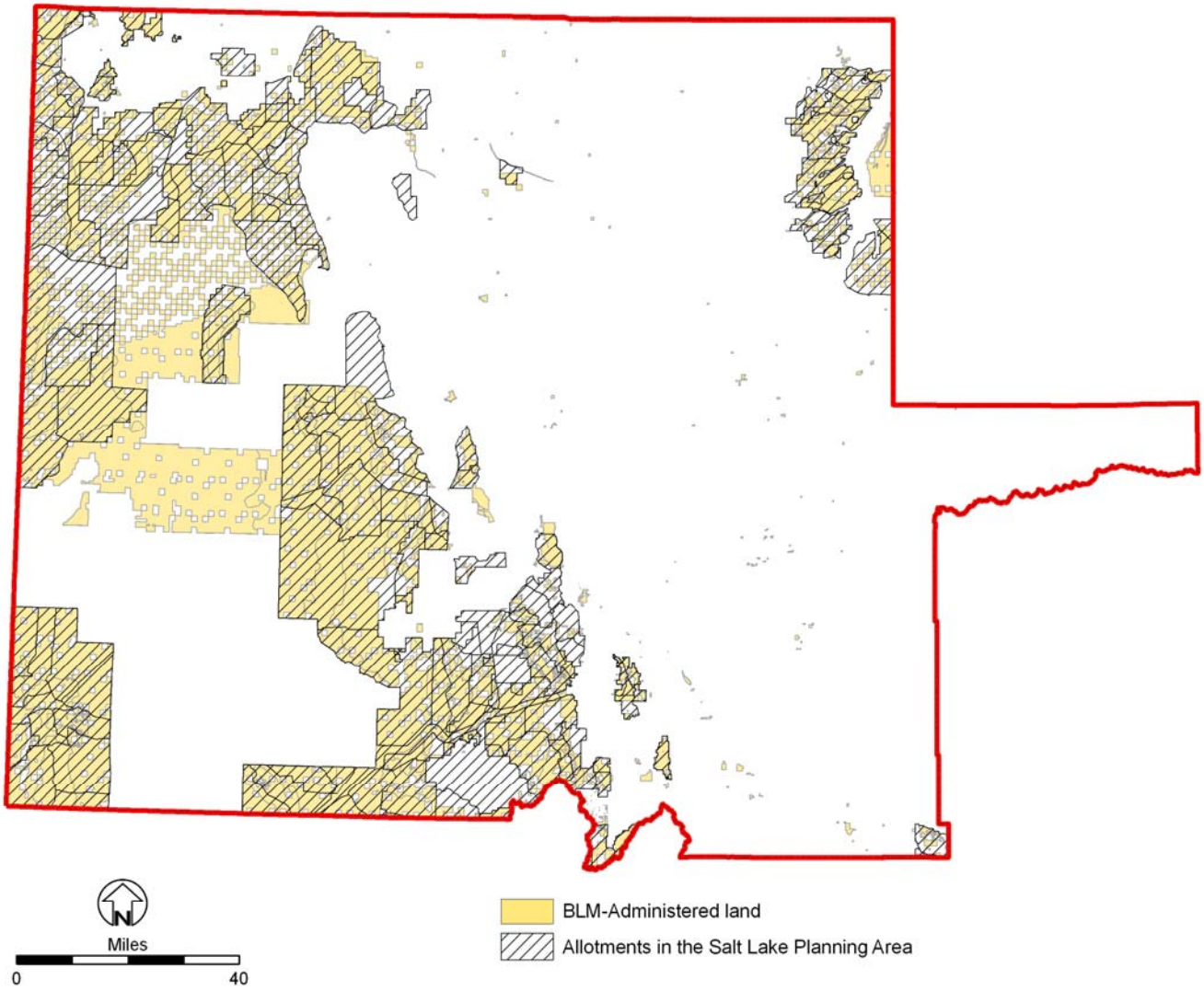
Grazing Systems

Seasons of use vary on each allotment throughout the Salt Lake planning area from a few-week season to a year-long season. Each allotment may have a number of pastures that are grazed in a rotation system. A deferred rotation grazing system rotates livestock use (e.g., livestock start and end in different pastures each year) through several pastures. A rest rotation grazing system includes a full year or more of rest for one or more pastures within the allotment. Each grazing system may include periodic rest depending upon the specific management concerns and needs for that allotment. The season of use for each allotment is described in the operator's grazing permit. Season-long use entails grazing one pasture from spring or early summer to late summer or fall. Some movement of livestock use may occur within the pasture (e.g., from canyon to canyon). Deferred rotation is a technique that uses the entire allotment by rotating pasture use (e.g., livestock start in a different pasture each year). Rest-rotation of pastures is a technique that involves grazing during certain periods and resting during other periods, with some pastures rested for the entire grazing season. Grazing systems are designed based on the requirements of key forage species in the allotment, the resources of concern on the allotment and the needs of the livestock producer and their livestock.

Allotments are periodically assessed for meeting multiple use objectives and all allotments are currently being assessed for meeting Utah's Rangeland Health Standards. This effort is to be completed by 2009. Periodic allotment assessments may indicate that changes in the season of use are necessary to meet rangeland health standards. Seasons of use are allotment-specific and may be managed as season-long or using a grazing system (e.g., rest rotation, deferred). If these assessments indicate that changes in livestock management are needed to meet the appropriate standards or other multiple use objectives, after consultation with the permittee changes to the terms and conditions of the permit would be made through agreement or by decision.

Grazing allotments typically contain improvements constructed by the permittee or by the BLM. These improvements include water troughs, guzzlers, rain water catch basins, and other water storage structures, fences, corrals, and other similar structures necessary for the successful use of the allotment.

FIGURE 3.3: LIVESTOCK GRAZING ALLOTMENTS IN THE SALT LAKE PLANNING AREA



3.3.6 WOODLAND AND FORESTRY

Most existing wood product use in the Salt Lake planning area is for firewood, and Christmas trees, with a minor component being for lumber and associated products. **Table 3.2** shows the occurrence of forested types, approximate acres for the planning area, and primary uses of the forests. Woodlands and forests comprise about 10% of the planning area.

TABLE 3.2: FOREST TYPES, ACRES AND PRIMARY USES IN SALT LAKE PLANNING AREA

Vegetation Type	Approx. Acreage in Planning Area	Uses
Pinyon and Juniper Woodland	322,896	Firewood, specialty lumber, biomass
Mixed Conifer/Aspen	27,680	Mixed conifer used for firewood, Christmas trees, pulp, lumber, log home construction, and fence posts. Aspen used for packing material (dunnage), pallets, erosion blanket, swamp cooler filters, matches, specialty lumber, fuelwood, fence posts, and pulp.

As shown in the **Table 3.3**, the predominant forest type in the planning area is the pinyon and juniper woodland category. This is the most extensive forest type in Utah, exceeding in acreage all other forests combined (Lanner 1984). Within lower elevations of this woodland zone, Utah juniper is frequently the only tree species. Efforts are being made to encourage non-commercial thinning of pinyon and juniper woodland for firewood use. The mixed conifer is comprised of fir, pine, and spruce species.

Old-growth forests are generally defined as being older than 150 years old. The primary forest type identified within the planning area as likely to have old-growth areas is the pinyon and juniper woodland. Harvesting or other activities affecting old-growth forests are generally restricted.

3.3.7 VEGETATION

Vegetation in the Salt Lake planning area is grouped into vegetation types with similar fire ecology. **Table 3.3** presents vegetation types, extent, and the percent coverage for the Salt Lake planning area. **Figure 3.4** illustrates the distribution of the various vegetation types identified within the planning area.

TABLE 3.3: VEGETATION TYPES IN SALT LAKE PLANNING AREA

Vegetation Type	Approx. Acres[1]	Condition Class (% of Veg. Type) [2]
Salt Desert Shrub	1,702,373	2 (43%) 3 (57%)
Sagebrush	1,122,262	2 (3%) 3 (97%)
Pinyon and Juniper Woodland	322,896	2 (32%) 3 (68%)
Mountain Shrub	29,395	2 (17%) 3 (83%)
Mixed Conifer/Aspen	27,680	2 (100%)
Total in Salt Lake planning area	3,204,606	

Sources:
[1]Utah GAP (Edwards et al. 1998)
[2]SLFO

Utah GAP was used to identify vegetative cover types pertaining to this project. Utah GAP provides an indicator of vegetation coverage and habitat types at the large scale, but is not particularly accurate on- the-ground for site-specific projects.

The balance of this section includes a discussion of vegetation related to fire ecology within and surrounding the Salt Lake planning area. Riparian vegetation type is discussed in Section 3.3.4. Aspen community type is included with the mixed conifer.

Condition Class

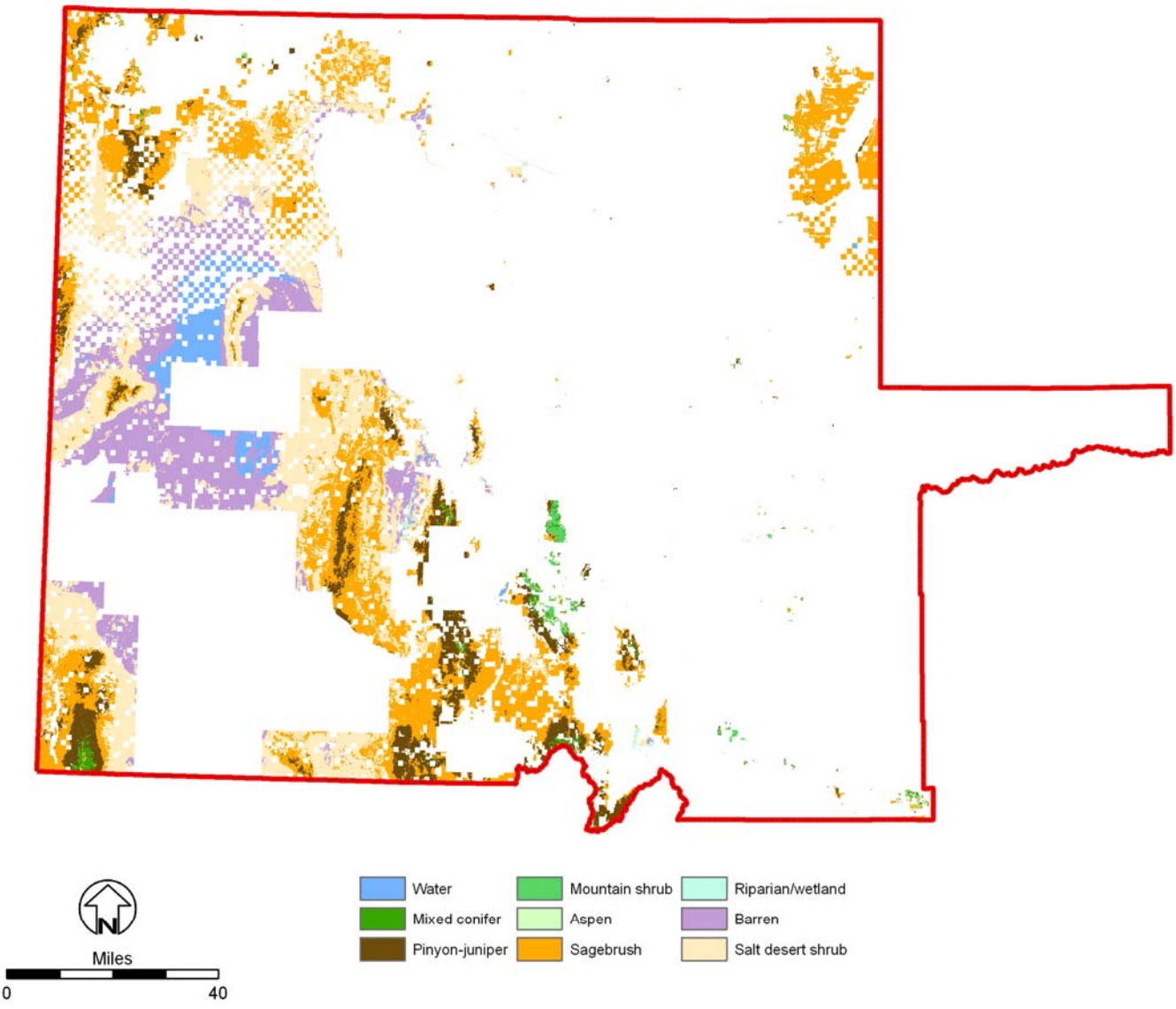
The species response and recovery to the presence or non-presence of a fire is referred to as succession. The various stages of resultant vegetation types or communities to reach recovery are referred to as seral stages, with the end result referred to as climax. This recovery can be predictable over time. For example, proper functioning grassland to sagebrush to pinyon and juniper woodland succession may require approximately 30-50 years in its historical, natural fire regime until another fire pushes it back to another earlier seral (grass) stage. The presence of nonnative species (and loss of native species) can affect the climax community of succession. A good example is nonnative cheatgrass, which is a species that did not evolve with the natural fire regime and may perpetuate through time and appear as climax.

Condition class is an interagency, standardized tool for determining the degree of departure from historical vegetation types and amounts and disturbance regimes. Assessing condition class can help guide management objectives and set priorities for treatments. Condition class was assigned to vegetation in the Salt Lake planning area through review of vegetation types identified by Utah GAP (Edwards et. al. 1998), and elevation ranges and professional knowledge by SLFO staff. A general description of the condition classes are found in **Table 3.4**.

TABLE 3.4: DESCRIPTION OF CONDITION CLASSES

Condition Class	Description
1	Within the natural (historical) range of variability of vegetation characteristics; fuels composition; fire frequency, severity and pattern; and other associated disturbances.
2	Moderate departure from the natural (historical) range of variability of vegetation characteristics; fuels composition; fire frequency, severity and pattern; and other associated disturbances.
3	High departure from the natural (historical) range of variability of vegetation characteristics; fuels composition; fire frequency, severity and pattern; and other associated disturbances.

FIGURE 3.4: VEGETATION TYPES ON BLM LANDS IN THE SALT LAKE PLANNING AREA



Salt Desert Shrub

This vegetation type is perhaps the most arid vegetation type in the Intermountain West (Wood and Brotherson 1986) occurring in valleys at the lowest elevation. The Salt Desert Shrub Vegetation Type consists of various associations of sub-types of vegetation within the SLFO. These associations are influenced by a high level of soil soluble salts and exchangeable sodium and are situated within lowland landforms of deep alluvial soil or on dry ridges. The three most common associations are Shadscale/Squirreltail, Winterfat/Squirreltail, and Greasewood/Basin wildrye.

The Shadscale/Squirreltail association was formerly a much larger unit, but much of this association has been replaced with Eurasian annuals including cheatgrass due to increased fire frequency. These sites are often very dry and have a "salty" silty crush. On healthy sites shadscale is abundant with associated species being squirreltail, bud sagebrush, low rabbitbrush, Galleta grass, Ephedra, Indian ricegrass, fluff grass, winterfat, gray molly, prickly pear, and various species of horsebrush.

The greasewood/basin wildrye association occurs on deep alluvial soils generally in basin bottoms of higher soil sodium than Shadscale and Winterfat sites. Occasionally this association is frequented by the occurrence of robust sagebrush plants. Common species also include basin wildrye, rubber rabbitbrush, annual saltbush, seepweed, squirretail, gray molly, saltgrass, alkali saccaton, and an abundance of cheatgrass during wet years when the soil sodium is modified to allow the growth of cheatgrass. During dry years the occurrence of short lived herbaceous vegetation is limited due to the transformation of the soil surface to an alkaline white crust.

The Winterfat/Squirreltail association occurs on deep silt loam soils. These sites when in late seral status also frequent the occurrences of scarlet globemallow, bud sagebrush, spiny horsebrush, longleaf phlox, Indian ricegrass and Sandburg bluegrass.

Smaller units that are more salt tolerant that exist in lower desert valleys and/or near salt marshes are stands of Gardner saltbush, gray molly, seepweed, pickleweed, salicornia, inland saltgrass, and alkali saccaton. These stands are of short height stature in which sub-components are often basin, annual saltbush, Nuttal alkaligrass, summer cypress, halogeton, creeping wildrye, and alkali switchgrass.

Salt desert shrub generally has low productivity, naturally sparse understory vegetation, and light fuels.

In the past 40 years, large expanses of salt desert shrub remain in condition class 2 or 3 because of the moderate to high departure from natural vegetation conditions being overtaken by invasive annual grasslands. Currently, cheatgrass has invaded all of the salt desert type found on the Salt Lake planning area and provides sufficient fuel loading to support large, fast-moving fires. Where cheatgrass has invaded, native salt desert shrub communities have been permanently lost or are at high risk of loss.

Sagebrush

Unlike the salt desert shrub type, which grows as mixed stands in saline and/or sodic soils, big sagebrush grows in non-saline, well-drained valleys and slopes and mostly forms monotypic stands. It is generally found above the valley bottoms, immediately below the pinyon and juniper woodland type. However, in the western portions of the planning area, two zones of big sagebrush may dominate a wide belt both below and above the pinyon and juniper woodland zone.

Since sagebrush develops in seral stages, many of the acres of native, perennial grasslands, shown in **Table 3.4** could be considered early seral sagebrush communities. In addition, at the scale of mapping for this EA, many areas identified as annual and perennial grasslands may contain inclusions of remnant sagebrush communities.

Healthy sagebrush is a patchwork mosaic of seral communities that can range from recovering perennial grass-shrublands following natural fire, to old growth, decadent sagebrush steppe with high canopy cover and reduced herbaceous understory (Wyoming Interagency Vegetation Committee 2002). Most of the sagebrush in the planning area is in condition class 3 due to the prevalence of invasive species (including cheatgrass and pinyon juniper).

The three main subspecies of big sagebrush (*Artemisia tridentata*) found on the Salt Lake planning area are as follows:

- Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) is the most common shrub in the intermountain basins (Knight 1994). It grows in pinyon and juniper woodlands and below on plains and foothills at elevations of 5,000 to 7,000 feet. Associated grasses are often scarce in this big sagebrush type.
- Basin big sagebrush (*Artemisia tridentata tridentata*) grows with Wyoming big sagebrush but is confined to valley bottoms in deep, well-drained sandy to loamy soils at 4,000 to 7,300 feet in elevation. Basin big sagebrush grows taller (up to six feet) and blooms later than Wyoming big sagebrush.
- Mountain sagebrush (*Artemisia tridentata vaseyana*). It grows within upland and mountain climatic regimes in the precipitation zones generally over 18 inches annually, with cooler soils and more resilient, intact native communities with abundant mountain shrubs and bunchgrasses. They are more susceptible to juniper encroachment mainly as a result of fire suppression. Depending on the soil type and depth, a variety of perennial grasses and forbs may dominate the understory.

On the drier sites, many sagebrush communities have degraded with extensive conversion to cheatgrass-dominated understories.

Pinyon and Juniper Woodlands

Pinyon and juniper trees are characterized by trees that are generally less than 33 feet tall, they comprise an open or closd woodland. The overstory includes singleleaf pinyon pine (*Pinus monophylla*) and Utah juniper species. In open woodlands the understory consists of shrub species such as big sagebrush and native bunchgrasses like bluebunch wheatgrass. Closed woodlands (greater than 60 percent canopy cover) are dominated by the same overstory species, however due to competition for sunlight, water, and nutrients understory vegetation is drastically reduced.

The occurrence of pinyon and juniper woodland occurs at an elevation that varies from 5,000 to 8,000 feet. This is between the lower elevation, more xeric, cool desert shrub community and the higher elevation, more mesic, mountain brush community (Welsh et al. 1993)]. On lower edges of the woodland zone, Utah juniper is frequently the only tree species; a mixture of pinyon and juniper occur in middle elevations. Pinyon with little or no juniper is found in the upper elevation range.

Juniper are considered climax species for a number of pinyon and juniper woodland and sagebrush habitats (sagebrush improves soil fertility and creates a microclimate underneath that favors the establishment of young juniper trees). An increase in sagebrush cover following livestock grazing has created a more favorable environment for juniper establishment (Knight 1994). Juniper has spread from thin substrates along ridges and mountain slopes to deeper valley soils. It is estimated that pinyon and juniper woodland has increased ten-fold over the past 130 years throughout the Intermountain West (Miller and Tausch 2001). The pinyon juniper in the planning area is in condition class 2 and 3 due to cheatgrass invasion, over abundance of pinyon juniper, and lack of native understories. Areas where juniper encroachment has occurred have also been invaded by cheatgrass in the understory, which raises concerns of further cheatgrass expansion following fire.

Mountain Shrub

Due to mostly xeric soil moisture regime in which summers are dry, mountain shrub vegetation consists of mostly short growing species. However, taller species are found generally in deeper soils and on northerly facing slopes. Common short growing mountain shrub associations are Snowberry/Letterman needle grass, Utah serviceberry/Snowberry/Bitterbrush, Bitterbrush/Mountain big sagebrush/Bluebunch wheatgrass, and Snowbush/Basin Wildrye. These associations are mostly found on mountain slopes of deep mollic (Mollic epipedon) soils. Cool season bunchgrasses and numerous forbs are constituents of these shrubby associations. Shrub components of these three associations are waxed-leaf currant, ocean spray and lanceleaf low rabbitbrush.

Taller associations for this type include stands of Mountain Mahogany/Slender wheatgrass, Chokecherry/Basin Wildrye, Scouler Willow/Blue Wildrye. The mountain mahogany is generally found on the drier limestone ridges of higher elevations. Chokecherry likes very deep mollic soil and the Scouler willow is found at high elevation also of deep mollic soil, but on yet colder and damper sites.

Two outlier shrubs also fit into this group. These species are common Gambel Oak/Slender Wheatgrass and Bigtooth Maple/Blue Wildrye Associations. The previous association is found on the eastern edge of Bonneville Basin near the Wasatch Front growing mostly in soils associated with limestone and quartzite, and the latter association grows in deeper soils and often cooler sites in the same zones, but also Rich County. Gambel oak is excluded from Rich County due to coldness.

Most of the mountain shrub communities are in condition class 3 due to high risk of cheatgrass invasion following disturbance.

Mixed Conifer/Aspen

This vegetation type may include Douglas-fir, white fir, Engelmann spruce, sub-alpine fir, bristlecone pine, lodgepole pine, and limber pine. This type occupies less than one percent of the BLM-managed lands on the Salt Lake planning area. Most of this vegetation type occurs at elevations above 7,000 feet.

Because there are numerous community types associated with this vegetation type, the condition and trends vary. In those conifer types associated with aspen, the trend is towards a greater representation of climax conifer vegetation, with a corresponding loss of seral stage aspen. In other conifer community types that lack the aspen component, the increasing density of shade tolerant species can place greater stress on larger older trees, mostly due to between-tree competition for water resulting in a greater susceptibility to insect and disease attack. At many sites, the stocking index is 15 times greater than pre-settlement times (Keyes et al. 2003). Mixed conifer in the planning area is in condition class 2, due to higher stocking than found historically, and is at risk of losing key ecosystem components following fire.

3.3.8 FISH AND WILDLIFE

For the purposes of this EA, general fisheries and wildlife refers to species and groups of similar species that do not have federal status (as defined in BLM Manual 6840, including ESA-related species), but may have other federal and/or state protection (e.g., under the federal Migratory Bird Treaty Act or Utah State Code) and are of concern to management authorities, Native American tribes, the general public, or groups (e.g., birders, hunters, etc.) with particular interest in a species or group of species.

General fisheries and wildlife groups considered in this document include fisheries, non-game (raptors, migratory birds, small mammals, carnivores and predators, and amphibians and reptiles), and big game (mule deer, Rocky Mountain elk, moose, and Rocky Mountain bighorn sheep). ESA-related and BLM sensitive

species are discussed separately. Scientific names and habitat associations for each of the species mentioned in this section are presented in **Table 3.5**. The water cover type is valuable wildlife habitat and has the potential to be impacted by the proposed project, so it has also been included.

TABLE 3.5: HABITAT ASSOCIATIONS FOR GENERAL FISH AND WILDLIFE SPECIES

Common Name	Species	Habitat
Fisheries		
Rainbow trout	*Oncorhyncus mykiss*	W
Brown trout	*Salmo trutta*	W
Brook trout	*Salvelinus fontinalis*	W
Lake trout	*Salvelinus namaycush*	W
Birds		
Ferruginous hawk	*Buteo regalis*	SDS, S, PJ, S, GG
Red-tailed hawk	*Buteo jamaicensis*	SDS, PJ, S, G, MS, MC, A
Northern goshawk	*Accipiter gentiles*	MC, A
Golden eagle	*Aquila chrysaetos*	SDS, PJ, G, MS, MC, RW, A, W
American kestrel	*Falco sparverius*	MC, RW, A
Osprey	*Pandion haliaetus*	RW, W
Northern harrier	*Circus cyaneus*	G, RW
Turkey vulture	*Cathartes aura*	SDS, PJ, S, G, MS, MC, RW, A, W
Lewis' woodpecker	*Melanerpes lewis*	MS, MC, RW
Abert's towhee	*Pipilo abertii*	RW
American avocet	*Recurvirostra americana*	RW
Mountain plover	*Charadrius montanus*	SDS
Lucy's warbler	*Vermivora lucidae*	SDS, RW
Sage grouse	*Centrocercus urophasianus*	S
American white pelican	*Pelecanus erythrorhynchos*	RW, W
Bobolink	*Dolichonyx oryzivorus*	RW
Virginia's warbler	*Vermivora virginae*	PJ, MS
Gray vireo	*Vireo vicinior*	PJ, MS
Bell's vireo	*Vireo bellii*	RW
Black rosy finch	*Leucosticte atrata*	S
Long-billed curlew	*Numenius phaeopus*	S
Sharp-tailed grouse	*Tympanuchus phasianellus*	S
Brewer's sparrow	*Spizella breweri*	SDS, S
Black swift	*Cypseloides niger*	RW

Common Name	Species	Habitat
Black-necked stilt	*Himantopus mexicanus*	RW
Broad-tailed hummingbird	*Selasphorus platycercus*	RW
Yellow-billed cuckoo	*Coccyzus americanus*	RW
Black-throated gray warbler	*Dendroica nigrescens*	PJ, MS
Three-toed woodpecker	*Picoides tridactylus*	MC
Sage sparrow	*Amphispiza belli*	SDS, S
Gambel's quail	*Callipepla gambelii*	SDS, RW
Flammulated owl	*Otus flammeolus*	MC, RW, A
Tree swallow	*Tachycineta bicolor*	MC, RW, A
Black-capped chickadee	*Parus atricapillus*	MC, RW, A
Mountain chickadee	*Parus gambeli*	MC, RW, A
Mammals		
Silver-haired bat	*Lasionycteris noctivagans*	MC, RW, A
Ringtail	*Bassariscus astutus*	MC, RW, A
Black bear	*Ursus americanus*	MS, MC, RW, A
Mountain lion	*Felis concolor*	PJ, MS, MC
Coyote	*Canis latrans*	SDS, PJ, S, MS, MC, A
Mule deer	*Odocoileus hemionus*	S, MS
Rocky Mountain elk	*Cervus elaphus*	S, MS, MC, A
Moose	*Alces alces*	S, MS, MC, RW, A
Rocky Mountain bighorn sheep	*Ovis canadensis canadensis*	S, MS

Habitat Codes: SDS = salt desert shrub, PJ = pinyon and juniper woodland, S = sagebrush, MS = mountain shrub, MC = mixed conifer, RW = riparian and wetland, A = aspen and W = water.

Fisheries

Seventy-three fish species and numerous species of mollusks and other macroinvertebrates are found on BLM-administered lands in Utah. Fish species found on BLM-administered lands that are not ESA-related or BLM-sensitive include the following: rainbow, brown, brook, and lake trout; suckers; shiners; dace; chubs; sculpins; and a variety of lesser known or less abundant species.

Native fish demonstrate a wide variety of life histories, including resident populations that inhabit small headwater streams with shorter migratory ranges, populations that use larger streams and main rivers, populations that are found in lake habitats, and populations that spawn in rivers or streams.

The quality of aquatic habitats on BLM-administered lands within the Salt Lake planning area varies widely across the state. Generally, aquatic habitats have declined since settlement of the region began in the 1850s. Disturbances contributing to decline of habitat have included logging, grazing, mining, recreation, water diversion for irrigation and domestic supply purposes, other surface disturbing activities, introduction of non-native species, wildland fire, insect infestation, disease, wind, floods, landslides, and avalanches. These

disturbances have resulted in the loss of riparian vegetation and subsequent changes in vegetation species composition.

Non-game Species

For the purposes of this document, non-game species are identified as raptors, migratory birds, small mammals, carnivores and predators, and amphibians and reptiles. The occurrence and distribution of each of these species are discussed briefly below.

Raptors: Raptors (birds of prey) found in and adjacent to the Salt Lake planning area include several species of hawks (e.g., ferruginous hawk, red-tailed hawk, and northern goshawk), eagles (e.g., golden eagle), falcons (including the American kestrel), owls, ospreys, northern harriers, and turkey vultures. These species inhabit various ecosystems and consume a wide range of prey.

During the breeding season, raptors are particularly sensitive to disturbance. Behavior during and following disturbance could result in nest abandonment or reduced productivity. Accordingly, raptors are provided with protection designed to prevent disturbance under the following federal acts: Migratory Bird Treaty Act of 1918, Eagle Protection Act of 1962 (as amended), and, for federally listed species only, the ESA of 1973 (as amended). In addition, the Utah Field Office of the USFWS has issued guidelines for establishment of disturbance-free buffer zones around raptor nests and identification of mitigation techniques available for use when management or development activities conflict with the buffer zones. In Utah, the largest buffer zone suggested for any raptor nest is one mile.

Migratory Birds: Migratory birds periodically travel from one region to another for breeding or feeding purposes. Generally, they nest in temperate North America and over-winter in portions of Mexico and Latin America. Migratory birds represent a diversity of species, including shorebirds, waterfowl, passerines (perching birds), and raptors, and may nest in any or all of the vegetation types within the planning area.

Utah Division of Wildlife Resources (UDWR) has prepared the Partners in Flight Avian Conservation Strategy, a document evaluating the status of 231 bird species, many of which are migratory, that breed in Utah (Parrish et al. 2002). Twenty-four bird species have been prioritized for management and protection, and occur mostly within four habitat types that have been designated by the UDWR as priority habitats. These habitats correlate with Utah GAP cover types and include salt desert shrub, pinyon and juniper woodland, sagebrush, and riparian and wetland (Parrish et al. 2002). The 24 priority bird species include: the Lewis' woodpecker, Abert's towhee, American avocet, mountain plover, Lucy's warbler, sage grouse, American white pelican, bobolink, Virginia's warbler, gray vireo, Bell's vireo, black rosy finch, long-billed curlew, sharp-tailed grouse, Brewer's sparrow, black swift, black-necked stilt, broad-tailed hummingbird, ferruginous hawk, yellow-billed cuckoo, black-throated gray warbler, three-toed woodpecker, sage sparrow, and Gambel's quail.

Some migratory birds are cavity nesters and may be found in forested habitat of varying elevation throughout the state. Cavity-nesting birds include several species of woodpecker. Woodpeckers are considered primary cavity nesters because they typically excavate their own nest cavities. Secondary cavity nesters are often incapable of excavating their own nest cavities and, therefore, rely upon existing cavities that have been previously established by woodpeckers. Secondary cavity-nesters include species such as the American kestrel, flammulated owl, tree swallow, and black-capped and mountain chickadees. While cavities may be excavated in live trees, standing dead trees (e.g., snags) are typically preferred by primary cavity-nesters and may be easier for secondary cavity nesters to access. Trees in the mixed conifer, aspen, and riparian and wetland habitat types each contain important nesting resources for cavity-nesting species.

Small Mammals: Small mammals include species groups such as prairie dogs, bats, squirrels, mice, and rabbits. Because these groups fill a variety of niches, small mammals are found in most habitat types within

the planning area. Although the term "cavity nester" typically refers to bird species, it may also include small mammals that use tree cavities for denning purposes. Small cavity-nesting mammals include species such as the silver-haired bat and ringtail.

Carnivores and Predators: These species are generally large, long-lived, solitary species. Although they are considered here to be non-game species, a variety of carnivores are managed by the UDWR. More plentiful carnivores are often hunted for food, sport, or as a management technique to allow prey species to thrive. Utah predators include species such as the black bear, mountain lion, and coyote. Although the black bear and mountain lion tend to remain more secluded in the mountain shrub and mixed conifer communities of mountains and foothills, the coyote may venture into urban and agricultural areas as a means of finding vulnerable prey. In general, there are predators where there is a prey source. And because predators consume birds and small mammals and often travel over large distances, they may be found anywhere within the planning area.

Amphibians and Reptiles: Because the majority of Utah's wildlife habitats are arid or semi-arid and such a small percentage of habitats are associated with water, reptiles are more prominent than amphibians. Reptiles are found throughout the planning area and may occur in any habitat type. Amphibians are found in and adjacent to wetlands, rivers and streams, mountain lakes, runoff pools in rock formations, and both ephemeral and permanent livestock watering ponds.

Big Game Species

Big game species include large, hunted animals such as mule deer, Rocky Mountain elk, and moose. Given the economic importance of big game, this group is typically managed more closely than other wildlife groups by UDWS.

Mule Deer: Mule deer occupy most ecosystems, but are characteristically found in shrublands with rough, broken terrain and abundant browse and cover. Mule deer winter diets consist primarily of browse in the form of sagebrush, bitterbrush, mountain mahogany, and other shrubs, as well as a small amount of grasses and pinyon or juniper. During the other three seasons, there is much wider distribution of nutritional resources. Mule deer summer use habitat primarily consists of mixed conifer, aspen, riparian and wetland, and grassland, while winter habitat primarily consists of low-elevation sagebrush and mountain shrub habitats on south-facing slopes.

Rocky Mountain Elk: The Rocky Mountain elk is a generalist, feeding on forbs and grasses during the spring and summer, and grasses and shrubs throughout the fall and winter. These feeding relationships are variable and depend largely on location. Various habitats include winter ranges, calving areas, and summer ranges. Calving areas are used from mid-May through June and are typically located at elevations higher than wintering grounds. Such areas consist of grassland, mountain shrub, mixed conifer, and aspen; and occur near cover, forage, and water resources (Fitzgerald et al. 1994).

Moose: The moose in Utah is typically associated with riparian and wetland and mountain shrub habitats. It feeds on leafy plants, as well as trees and shrubs, including aspen, birch, and willow. Before 1918, moose did not readily occur in Utah. Since that time, moose populations have increased, and they are found throughout the northern portions of Utah in places closely associated with mixed conifer, aspen, mountain shrub, riparian and wetland, and grassland habitats (Zeveloff and Collette 1988).

Rocky Mountain Bighorn Sheep: Bighorn sheep inhabit remote, mountain, and desert locations, and are often found on cliffs and rocky slopes in rugged canyons. These sheep are most closely associated with sagebrush, grassland, and mountain shrub habitats (Chapman and Feldhamer 1982). Bighorn sheep are active during the daytime and feed on grasses, trees, and shrubs, depending upon availability, succulence, and

nutrient content. The Rocky Mountain bighorn sheep can be found in several mountain ranges in central and northern Utah.

3.3.9 SOILS

Soils in the SLFO are young in the basin bottoms, but become much older above 5,000 feet which is above prehistoric Lake Bonneville. Most of the soils are derived from limestone and quartzite parent material. The soils are very deep in the valley bottoms due to sediments from the fluvial lakes, but are shallow in many of the mountainous areas due to the rock outcrops of limestone and quartzite. Between the basin bottoms and mountains are piedmont slopes that contain deep alluvial and colluvial soils. Some soils in the Frigid Temperature Regime above 7,000 feet are deep and provide for abundant vegetation growth.

Most of the soils have a high level of soil reaction due to high amounts of sodium and calcium carbonates. Most of the soils fall into the Xeric Soil Moisture Regime in which soils are moist during the cool season but dry during the hot season. Due to the soil's low organic carbon and high calcium content coupled with hot and dry summers, plant species are typically cool season species and grow during the spring and fall.

Soil texture leans more towards sandy texture than clay which results in soils that of high permeability and low soil compaction potential. These soils especially in the western portion of the field office are subject to a high degree of wind erosion since much of that area has little vegetation to protect the soil surface. Natural erosion results in minimal development of biological crusts.

Erosion and Run-off

Soils may be eroded by water or wind. Water erosion is influenced by the intensity and duration of precipitation, soil texture, soil organic matter, permeability, topography, and vegetation (or artificial) cover. Areas with soils on steep slopes, low infiltration rates, and minimal vegetation cover have the highest erosion hazard. Wind erosion also has the potential to move large volumes of soil and primarily a function of wind velocity and grain size (Ritter et al. 1995).

Erosion may decrease soil productivity, expose plant roots, impede revegetation efforts, and increase salinity downstream. Many soils throughout the planning area have features that make reclamation and revegetation difficult. These limiting features involve salinity, sodium content, clayey and sandy textures, drought conditions, alkalinity, low organic matter content, shallow depth to bedrock, stones and cobbles, propagule-rich soil, and high wind erosion potential. Certain geological formations tend to form soils that are highly erosive.

Soil Quality and Health

The capacity of a soil to sustain plant and animal productivity is related to its inherent physical, biological and chemical properties as well as its current health or condition. Three key attributes of soil and rangeland health have been identified that may assist in assessing the status or health of an area. Site stability relates to the ability of the soil to resist erosion (and loss of nutrients) by wind and water. Hydrologic function is the capacity of the site to capture, store, and safely release water from rainfall and snowmelt. Biotic integrity is the capacity of a site to support both functional and structural plant, animal, and soil biological communities within the range of variability for that site (BLM 2000).

Effects of soil health and erosion are often associated with water quality and wetland/riparian areas. These resources are discussed in the water quality and wetlands and riparian zones sections of this chapter, respectively.

3.3.10 RECREATION

Recreation is one of the major resource uses within the planning area. The term "recreation" includes a variety of activities that affect and are affected by resources and other resource uses. The Salt Lake planning area offers a wide variety of recreational opportunities, especially for dispersed use that requires undeveloped open space. These activities include off-highway vehicle (OHV) use, camping, hunting, target shooting, hiking, backpacking, horseback riding, wildlife viewing, fishing, bicycling, photography, camping, orienteering, rock climbing, mountain biking, and sightseeing. The SLFO also authorizes a variety of special recreation permits, which include such activities as speed races on the Bonneville Salt Flats, OHV events, hunting guide services, competitive races, a youth treatment program, and organized group events.

Recreational use is counted as visitor use and is measured in "visitor days." A visitor day represents one person doing an activity for all or part of one day. For example, if one person spent one night camping on public lands, it is counted as two visitor days. More than seven million visitor days occurred on Utah public lands in 2002 (BLM 2003c).

Recreation resources include recreation sites and dispersed public lands, wildlife resources, visual resources, and other resources (physical, historical, etc.), each of which provides different recreational opportunities.

In areas where recreation resources receive heavy use, developed recreation sites are often constructed to aid in managing impacts. Consequently, developed recreation sites are primarily located near high-use recreation attractions.

These developed recreation areas may include such permanent features as:

- Picnic tables
- Drinking water facilities
- Vault toilets
- Shade structures
- Parking lots with traffic flow controls such as striping, islands, boulders, and rope fences
- Water drainage systems
- Signage; including maps, brochures, speed limits, recreation safety, wildlife, and noxious weed information
- Bulletin boards and visitor registration/fee stations
- Traffic counters

Growth in the use of OHVs on public land has substantially increased over the past few years. The Utah BLM takes a balanced approach to managing OHV use, placing priority on protecting public land resources, while providing diverse opportunities for the responsible use of OHVs (BLM 2001). During the RMP process, all public lands are designated as open, limited, or closed to motorized use. An open designation allows intensive OHV use where there are no compelling resource protection needs, user conflicts, or public safety issues. An area designated as limited restricts OHV use to meet specific resource management objectives. Limitations may occur on number or type of vehicles, time and season of use, or specific roads. An area is designated as closed to protect resources, ensure visitor safety, or reduce user conflicts.

Recreation sites and areas present within the planning area are shown on **Figure 3.5**.

FIGURE 3.5: RECREATION SITES IN THE SALT LAKE PLANNING AREA

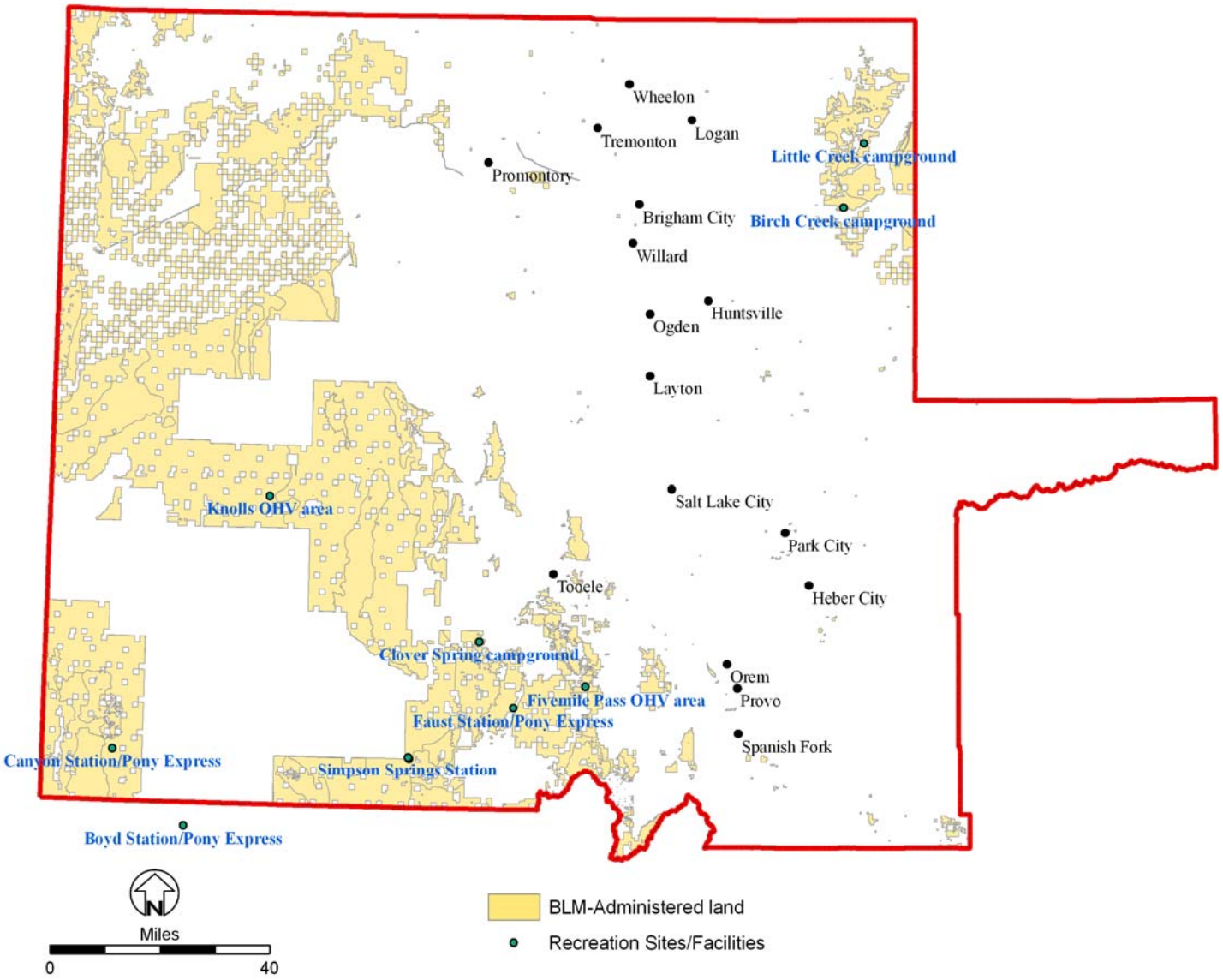


FIGURE 3.4: VEGETATION TYPES ON BLM LANDS IN THE SALT LAKE PLANNING AREA

3.3.11 SOCIOECONOMICS

Several means are used to characterize the social and economic conditions present in the Salt Lake planning area. Of particular importance to this EA are identifying the region of influence (ROI) pertaining to this planning area and population and employment information for the area. Both of these facets are discussed below.

Region of Influence

The Salt Lake planning area, which encompasses Box Elder, Cache, Davis, Morgan, Rich, Salt Lake, Summit, Tooele, Utah, Wasatch, and Weber counties, represents the ROI for social and economic. The ROI is defined as the geographical area in which the principal direct and indirect socio-economic effects of the Proposed Action Alternative and the No Action Alternative for the Salt Lake planning area are likely to occur. The principal issues of concern for the Salt Lake ROI would be threats to infrastructure, other economic resources and communities at risk from wildland fires.

Population and Employment

Baseline data for the Salt Lake planning area ROI includes population and demographic data as well as current business and economic statistical information for the state obtained from the Bureau of Labor Statistics and the Bureau of the Census, based on 2000 census data. Additional information was obtained from the Sonoran Institute database prepared for the BLM (Sonoran Institute 2005). These data are summarized below.

The ROI counties collectively had a total population in 2000 of 1,931,362. The primary population centers are located along the Wasatch Front and include Salt Lake City, Provo, and Ogden, and the surrounding metropolitan area consisting of numerous communities. The ROI also includes numerous mountain resort communities and other small mountain towns adjacent to forested public lands. The Great Salt Lake and the Great Salt Lake Desert occupy most of the western half of the ROI. This region is very desolate with few economic centers apart from those located closer to the Wasatch.

Collectively, the majority of the employment in the ROI counties is in the Services and Professional industry sector, which represents approximately 66.5 percent of the total employment in the ROI in 2000. Most of the jobs in this category are affiliated with health, legal, and other business-professional services typical in large urban areas. Retail trade is also a major component of this industry sector. Government jobs represented approximately 14 percent of the total employment, followed by manufacturing (10.4 percent). Farming and agriculture is not a significant contributor to the economy of the ROI as a whole; however, where it occurs it is predominantly associated with cattle ranching and crop production. Livestock grazing relies heavily on federal grazing allotments. The SLFO currently administers grazing on 153 allotments in Box Elder, Rich, Tooele, and Utah Counties.

Woodland products harvested from public lands in the ROI include live cedar post cutting, green and dead firewood cutting, Christmas tree cutting, seed gathering (shadscale, Gardner saltbush, forage kochia, rabbitbrush, winterfat, and Indian ricegrass), and some pine nut collecting or collecting of small vegetation for landscaping purposes (BLM 1998a). Other economic uses of public lands in the ROI include rights-of-way for utility corridors, roads, and pipelines. Public lands in the mountainous regions provide a recreational draw to the area for both summer and winter sports.

3.3.12 WILDERNESS CHARACTERISTICS

Non-wilderness Study Areas with Wilderness Characteristics

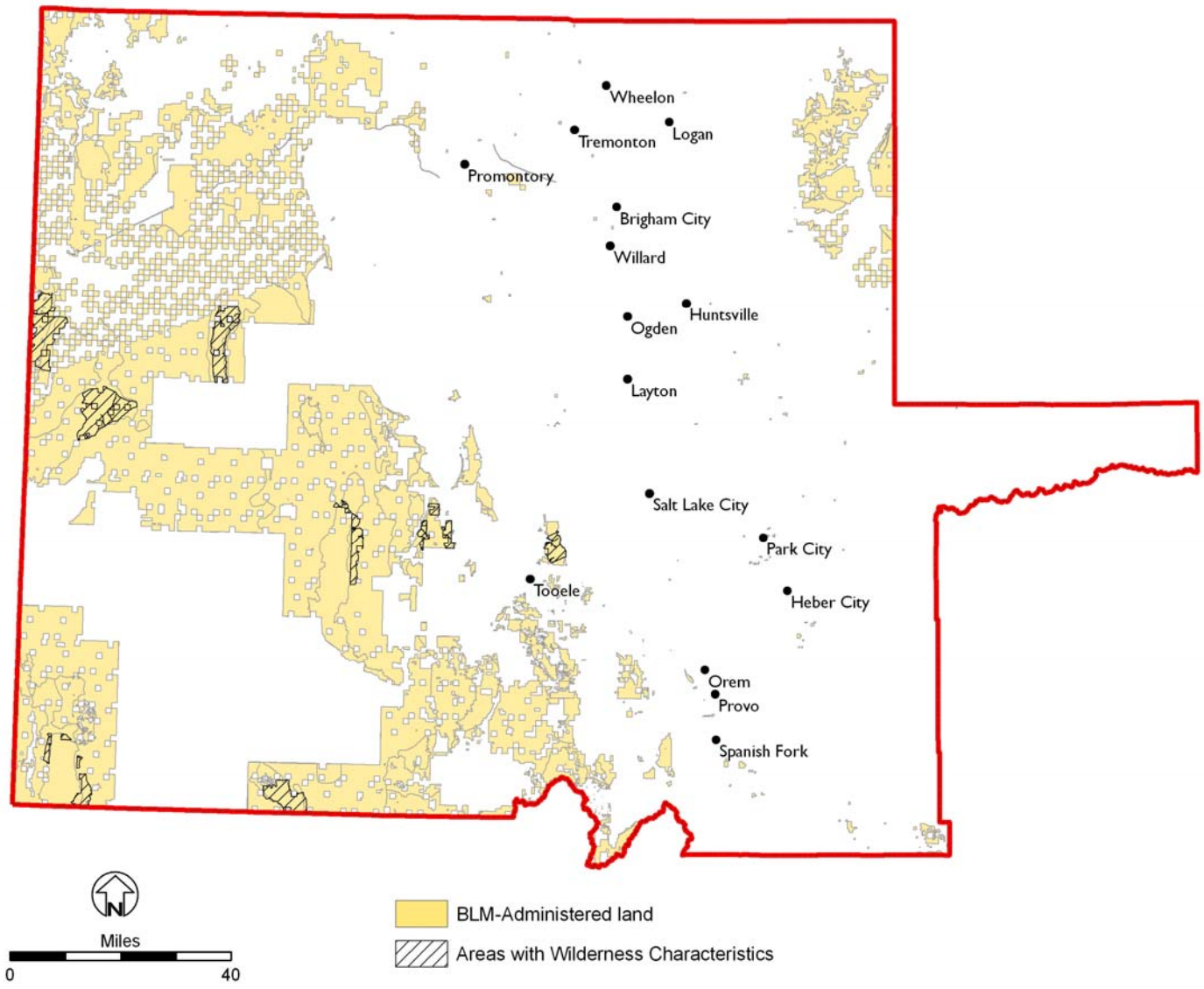
"Wilderness characteristics" are defined as features of the land associated with the concept of wilderness that may be considered in land use planning when BLM determines that those characteristics are reasonably present, of sufficient value (condition, uniqueness, relevance, importance) and need (trend, risk), and are practical to manage. The BLM may consider information on wilderness characteristics, along with information on other uses and values, when preparing LUPs. Lands with wilderness characteristics may be managed to protect and/or preserve some or all of those characteristics. This may include protecting certain lands in their natural condition and/or providing opportunities for solitude, or primitive and unconfined types of recreation.

The 1999 BLM Utah Wilderness Inventory provides detailed descriptions of all of the wilderness character areas (BLM 1999).There are eight areas, totaling approximately 156,908 acres that have been identified as having wilderness characteristics within the planning area (BLM 1999). These areas are shown on **Figure 3.6** and listed in **Table 3.7**.

TABLE 3.7: NON-WILDERNESS STUDY AREAS WITH WILDERNESS CHARACTERISTICS

Name	Approx. Acres
Cedar Mountains	12,336
Deep Creek Mountains	11,900
Dugway Mountains	22,811
Newfoundland Mountains	22,805
North Stansbury Mountains	9,296
Oquirrh Mountains	8,394
Pilot Range	34,172
Silver Island Mountains	35,194
TOTAL	**156,908**

FIGURE 3.6: NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS IN THE SALT LAKE PLANNING AREA



CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter discloses the predicted direct, indirect, and cumulative effects on the affected environment as a result of the alternatives.

This chapter is organized with discussions of direct and indirect impacts on each resource (as defined in the BLM *Land Use Planning Handbook H-1601-1*, as amended) (BLM 2004c) under both the Proposed Action Alternative and No Action Alternative scenarios. The analyses of impacts of fire management actions on each resource are discussed in a short and long-term context. A cumulative effects section is presented at the end of the chapter, which analyzes both the Proposed Action Alternative and No Action Alternative.

To provide additional context in the analysis of impacts from fire management actions associated with both alternatives, a general description of fire's effects on each resource is presented as **Appendix F**. Environmental effects would occur regardless of what alternative is selected.

Locations, geographic extent, and intensity of wildfire events are not known. Therefore, the effects analysis is focused on impacts across the entire planning area and not on particular sites or FMUs. Prior to implementation of management actions, additional environmental analyses would occur for site-specific proposals. The following assumptions were used in the effects analysis for this EA:

- The fire management actions that were analyzed for potential impacts on resources of concern are: (1) wildland fire suppression, (2) prescribed fire, and (3) non-fire fuel treatments.
- Short-term is defined as less than five years, and long-term is defined as 6 – 15 years.
- If the Proposed Action Alternative were implemented, a measurable reduction in occurrence, severity, or size of wildfires would not be expected in the short-term. The difference in impacts between the alternatives would be primarily in the long-term.
- References to impacts from wildland fire suppression include the suppression and ESR.
- Prescribed burning is typically accomplished to benefit resources in the long-term.
- Planned fuel treatments include prescribed fire and non-fire fuel treatments. Although the SLFO could use chemical and biological treatments as part of their non-fire fuel treatments, less than 4,000 acres would be deemed appropriate over ten years. Any impacts from chemical or biological treatments would be discussed in greater detail in subsequent, site-specific analysis.
- Planned actions are implemented only in areas with a low risk of noxious weed infestation or when the action includes a component (e.g., seeding) to reduce the risk of infestation.
- Seeding can be a component of ESR actions, prescribed fire, and non-fire fuel treatments (mechanical, biological and chemical).

4.2 PROPOSED ACTION ALTERNATIVE

4.2.1 CULTURAL RESOURCES (Including Native American Religious Concerns)

Short-term Effects on Cultural Resources

The direct effects of fire suppression efforts, prescribed fire, and mechanical fuel treatments could impact the thousands of cultural resource sites within the Salt Lake planning area. RPMs incorporated into the Proposed Action Alternative, such as pre-treatment surveys and subsequent avoidance (as well as the Utah State

Protocol Agreement 3-7-01), should minimize these effects; however, not all cultural resources are easily detectable or avoidable. [Including those recognized in congressional and administrative designated areas of importance (including ACECs with cultural or archaeological values)].

Cultural resources are often at greater risk due to fire suppression activities than from the wildland fire itself. Suppression efforts may cause surface disturbances, such as fireline construction (hand and bulldozer lines), the establishment of helicopter bases, safety zones, fire camps, etc. These disturbances may destroy artifacts and the integrity of cultural resource sites. Water, foam detergents, and fire retardants could damage artifacts and features by causing swelling and contraction, rock art is particularly sensitive to staining by retardants. Other potential short-term impacts would include damage (e.g., breakage, spalling, corrosion, staining, rusting) associated with rapid cooling of archaeological materials. Discoloration or warping of metallic surfaces could also occur. For all wildland fires or prescribed fires, post fire vandalism and artifact collection could occur as visibility of sites increases after vegetation is removed.

In contrast to the No Action Alternative (the current wildland fire management direction), the Proposed Action Alternative would reduce the level of impact on cultural resources through its emphasis on resource protection. These protections are incorporated into the Proposed Action Alternative through RPMs. Minimal differences in fire severity would be expected between the Proposed Action Alternative and the No Action Alternative. However, the Proposed Action Alternative has a ten-year suppression goal of over three times as many wildland fire-impacted acres as the No Action Alternative. Under the Proposed Action Alternative, historic-aged resources would be more prone to impacts from wildland fire relative to prehistoric-aged resources (SHPO 2005). Impacts would be further minimized through consultation with a cultural resource specialist during suppression and ESR activities in areas containing sensitive cultural resources.

ESR, prescribed fire, and non-fire fuel treatments efforts with the potential to affect cultural resources are subject to the requirements of Section 106 of NHPA, as amended, 36 CFR 800, which requires consultation with the Utah State Historic Preservation Officer. Areas with surface disturbance would be subject to a cultural resource inventory. The potential for proposed prescribed fire and non-fire fuel treatments to impact cultural resources would be considered, on a project-by-project basis, during all phases of planning and implementation. Complete avoidance is the most commonly selected method for the management of cultural resources located in the area of potential effects for prescribed fire and non-fire fuel treatments.

Prescribed fire events are sometimes preceded by non-fire fuel treatments to obtain a smaller, more manageable, and less severe prescribed fire and are typically conducted outside the primary season for wildland fires. Therefore, prescribed fires are typically of lower temperature and shorter duration than wildland fire. Potential impacts from prescribed fire activities would be less severe than from unplanned fire.

Non-fire fuel reduction treatments can directly impact cultural resources, depending upon their location and type. Ground disturbing treatments (like brush crunching) are more likely to impact cultural resources than chemical treatments. For planned treatments, the potential for impacts on cultural resources would be negligible to minor.

Long-term Effects on Cultural Resources

The continued trend toward a decrease in hazardous fuel loads would decrease the incidence of large, severe wildland fires. A decrease in the impact on cultural resources from ground disturbing suppression activities would be realized in the long-term. Heat and duration-related impacts from wildland fires would be similarly reduced over time.

Again, because prescribed fires are typically of lower temperature and shorter duration than wildland fire, potential impacts from prescribed fire activities would be less severe than impacts from uncontrolled wildland fire. Acreage would shift from higher to lower condition classes with the use of prescribed fire and

non-fire fuel treatments, resulting in further decreases in the likelihood of uncontrolled, high-intensity fires that carry a higher risk of impacts on cultural resources. The long-term, net effect of the Proposed Action Alternative would be greater protection of cultural resources than under the No Action Alternative.

4.2.2 SPECIAL STATUS SPECIES

Short-term Effects on Special Status Species

ESA-related Species

In accordance with Section 7(a) 2 of the ESA of 1973, as amended, the Utah BLM State Office engaged in formal Section 7 consultation with the USFWS. This process involved preparing a biological assessment (BA), which included impact analyses and subsequent determinations for all federally listed and proposed species. It also considered potential project-related effects (direct and indirect) to each species and their habitat (including those areas designated as critical habitat) from the fire management actions presented in the Proposed Action Alternative.

Effects determinations within the BA include May Affect, Not Likely to Adversely Affect (NLAA); May Affect, Likely to Adversely Affect (LAA); and Not Contribute to Federal Listing (NCL). Each determination was based on a combined analysis of potential effects from the Utah LUP Amendment for Fire and Fuels Management EA and the five FMP EA Proposed Actions (Salt Lake, Vernal, Moab, Southern Utah Support Center, and Richfield). For any species with designated or proposed critical habitat, the determination for effects to that habitat was combined with the determination for effects to the species. In this EA, we would only present the determinations for each species that is known to occur within, or has potential to occur within, the Salt Lake planning area. Determinations take into consideration potential short-term, long-term, and cumulative impacts from wildland fire suppression, prescribed fire, and non-fire fuel treatments.

Six species were given a determination of LAA and five species were given a determination of NCL. No species within the Salt Lake planning area were given a determination of NLAA. The six species that were given a determination of LAA include: black-footed ferret, Canada lynx, bald eagle, June sucker, Lahontan cutthroat trout, and Ute ladies'-tresses. Designated critical habitat has been finalized (and effects on that critical habitat is analyzed in the BA) for the June sucker. The five species that were given a determination of NCL include candidate and/or petitioned species: white-tailed prairie dog, pygmy rabbit, western yellow-billed cuckoo, fat-whorled pondsnail, and Goose Creek milk-vetch. For a detailed discussion on the effects determinations refer to the BA.

Additional consultation with the USFWS would still be required for all implementation-level fire management activities if they would occur within suitable or potentially suitable habitat for federally listed species. The Alternative Consultation Agreement to Implement Section 7 Counterpart Regulations could be employed to enhance the efficiency and effectiveness of the consultation process for projects that support the National Fire Plan.

BLM Sensitive Species

In addition to RPMs designed to protect ESA-related species and their habitat, RPMs to protect BLM sensitive species have been designed and built into the Proposed Action Alternative. These RPMs include review and inclusion of appropriate management, conservation, and plan direction into project proposals, and adherence to management direction contained in the BLM Manual 6840 - Special Status Species Management. The RPMs would also assure that any proposed project would conserve BLM sensitive species and their habitats, and that any action authorized, funded, or carried out by the BLM would not contribute to the need

for any special status species to become listed. RPMs would be implemented during wildland fire suppression, prescribed fire, and non-fire fuel treatment activities, as applicable.

General Short-term Effects on ESA-related and BLM Sensitive Species

Some of the goals of the Proposed Action Alternative are to restore historical habitats and native plant species, and enhance, maintain, and protect ecological resources. Where practical and appropriate, these would likely be accomplished through the implementation of rehabilitation (post-wildfire and post-treatment) activities. The potential for short-term adverse impacts from fire management actions would be offset by long-term beneficial effects of rehabilitation activities (built into the Proposed Action Alternative for soil disturbing activities), protected ecological resources (remaining after a suppression event), and reduction of fuels (following implementation of a prescribed fire or non-fire fuel treatment). The subsequent, gradual return to a more natural fire regime would result in long-term beneficial effects to species and habitat.

Despite the particular life history and habitat requirements of each special status species, some potential short-term effects can be generalized based on common ecological principles and the types of fire management activities being proposed. The items presented below include general impacts that could occur following implementation of the Proposed Action Alternative (with its RPMs). In some cases, depending upon the severity or scope of an effect or recovery rates of a particular species or habitat component, specific effects could be short or long-term and are, accordingly, listed as such. Typically RPMs have been designed to minimize effects (particularly from pre-planned fire management activities such as prescribed fire and non-fire fuel treatments).

Wildland fire suppression has the highest potential for negative effects on special status species because RPMs would not necessarily be fully implemented due to the risks to firefighter and/or public safety and also because of the nature of emergency fire suppression actions sometimes requires quick response without detailed, site-specific data or analysis. These short-term impacts could include the following:

- Visual or auditory disturbance or displacement of individuals (affecting foraging, roosting, and/or reproductive behavior) because of vehicles, heavy equipment, firefighters, and low-flying aircraft during fire suppression operations. This includes nest/den abandonment or mortality of young or eggs.
- Mortality or injury of adults, young, or eggs from smoke inhalation during fire operations, or from vehicles or equipment used during fire suppression operations.
- Mortality of adults, young, or larvae of aquatic species from using occupied water sources for fire suppression operations.
- Injury or mortality due to inadvertent strikes during aerial drops of fire retardant.
- Illness or mortality due to inadvertent chemical contamination of terrestrial or aquatic species' habitats during aerial applications of fire retardant.
- Heat stress or mortality to special status plants from firing operations.
- Crushing of special status plants, resulting in damage or mortality, from human foot traffic or use of vehicles or heavy equipment in fire suppression operations.
- Damage to the seedbank of special status plants from severe fire or mechanical disruption during fire suppression operations.
- Removal of key habitat components for nesting, denning, foraging, roosting, or cover due to equipment use or operational tactics, including the following:
    - Snag removal for safety reasons;
    - Tree and shrub removal and associated soil disturbance during fireline construction;

    - Vegetation removal and associated soil disturbance during helipad, base camp, or road construction;
    - Vegetation removal and soil disturbance during temporary road construction for access; and
    - Decreased water quantity for aquatic species from dewatering during low flow periods.
- Damage or loss of riparian or upland vegetation or downed woody debris, and increased surface run-off from fire suppression operations, resulting in the following:
    - Decreased channel stability and alteration of channel morphology;
    - Increased erosion, sediment, and ash levels within and adjacent to the stream channel;
    - Increased water temperatures;
    - Degraded water quality (based on nutrient levels, temperature, and sediment levels);
    - Reduced riparian habitat, in-stream habitat cover, and woody debris that is typically necessary for properly functioning riparian areas and aquatic habitat;
    - Altered water velocities and substrate composition; and
    - Altered composition and decreased abundance of aquatic and terrestrial food sources.
- Increased risk of predation from removal of cover.
- Changes in foraging habitats and/or food and prey quality and quantity.
- Spread of disease or non-native, predatory species within previously uninfected water sources.
- Soil erosion of special status plant habitat following fire suppression operations.
- An increase in invasive plant species (from wildfire and fire suppression tactics) that could out-compete special status plant species.

Because of specific operational prescriptions for prescribed fire, RPMs would be incorporated into site-specific project plans. This would allow BLM to minimize or avoid many negative short-term effects to special status species. Conversely, this type of fire would have a greater potential for positive long-term benefits to special status species and their suitable habitat (including designated and critical habitat), than wildland fire suppression. Thus, the short-term effects on special status species that could occur from prescribed fire are the same as those listed above for wildland fire suppression.

Direct and indirect effects from non-fire fuel treatments would be similar to those listed for prescribed fire. Because of pre-planning and specific operational prescriptions for non-fire fuel treatments, RPMs would be incorporated into site-specific project plans and operations, as necessary. This would allow BLM to avoid or minimize adverse short- and long-term effects to federally protected species. Conversely, these pre-planned treatments would have a greater potential for beneficial long-term effects to special status species and their habitat (including any designated critical habitat) than wildland fire suppression. Thus, the following short-term impacts from non-fire fuel treatments could affect special status species:

- Visual or auditory disturbance from vehicles, heavy equipment, and humans.
- Displacement or crushing of small animals (special status species or their prey) and special status plants from vehicles, heavy equipment, or piling of slash during treatments.
- Removal of key habitat components for nesting, denning, foraging, roosting, dispersal, or cover from clearing vegetation, snags, or downed woody debris during treatments.
- Soil or ground disturbance from vehicles or heavy equipment during treatments, resulting in disturbance or destruction of vegetation (federally protected plant species and habitats for wildlife or fish) and subsurface dens or burrows.
- Damage to the seedbank of federally protected plants due to mechanical disruption during manual or mechanical treatments.

- Increased risk of predation from removal of cover.
- Changes in foraging habitats or food and prey quality and quantity.
- Soil erosion of special status plant habitat following mechanical treatments in which seeding is unsuccessful, inappropriate, or infeasible.
- An increase in invasive plant species that could out-compete federally protected plant species following treatments in which seeding is unsuccessful.

Short-term Effects on ESA-related and BLM Sensitive Species Habitat

Special status species have suitable habitat and are known to occur within all vegetation types within the planning area. Habitat for these species would be vulnerable to any of the impacts that are discussed in Section 4.2.8 (Vegetation). Although fire management activities would vary among vegetation communities, they could affect species and species habitat to varying degrees within all of the vegetation/habitat types depending upon when and where a management action would take place. Because species occurrence records do not account for areas that have not been surveyed, unknown individuals or populations of a particular species could exist within any of these vegetation communities. RPMs have been incorporated into the Proposed Action Alternative that would address suitable habitat of unknown populations in each vegetation type.

The goals and objectives of the proposed fire management actions are based on the types and conditions of various vegetation communities within the Salt Lake planning area. In turn, these vegetation communities provide the key habitat components for the various special status species. Many habitats within Utah have been altered by human-caused changes in the structure or composition of vegetation communities, resulting in a change in the historical FR. Some habitats that are fire-adapted have had fire excluded, while noxious weed infestations now carry wildland fires in some non-fire-adapted habitats. Heavy fuel loads or invasive non-native plant species put these vegetation communities, and thus the species that inhabit them, at greater risk from severe wildland fire.

These changes in vegetation structure and composition can alter both the quality and quantity of various habitats for the special status species that occupy them. For impacts analyses for special status species, the baseline is not a condition of "no wildland fires," but rather the current condition of the vegetation communities in which the species live, and the current risk of severe wildland fire. The Vegetation section of this EA describes the condition class, fire ecology, and current status of the vegetation communities on BLM-administered lands in Utah that, in turn, provide the basis for analysis of the Proposed Action Alternative. The list of habitat associations in Chapter 3 of this EA links the special status species that could be affected by the Proposed Action Alternative, with each vegetation community within the planning area.

***Sagebrush and Salt Desert Shrub*:** Species that are found within sagebrush and salt desert shrub habitat would be more likely than those found in many other habitats to incur short-term project-related impacts because this habitat is relatively far-removed from its natural FR. Short-term impacts from implementation of fire management activities could consist of species mortality, temporary displacement, or habitat loss.

Pinyon and Juniper Woodland: Because this habitat is relatively far-removed from its natural FR and would, therefore, likely be targeted for fire management actions, species that are found within pinyon and juniper woodland habitat would be more likely than those found in some other habitats to incur short-term project-related impacts. In addition, species in this habitat would incur greater impacts than those in some other habitats because the expanse of this habitat type would decrease. Short-term impacts from implementation of fire management activities could consist of species mortality and temporary displacement, and would consist of habitat loss.

Mountain Shrub and Mixed Conifer: Species that are found within this habitat could incur short-term project-related impacts during fire management actions designed to maintain or lower the current condition class. Short-term impacts to mountain shrub species could include mortality, temporary displacement, and habitat destruction.

Riparian and Wetland: Species that are found within riparian and wetland habitat could incur short-term project-related impacts during fire management actions, including mortality, temporary displacement, and habitat loss or destruction.

Aspen: Species found within aspen habitat could incur short-term project-related impacts during fire management actions. Short-term impacts from these fire management activities could result in mortality, temporary displacement, or habitat destruction.

Water: Direct effects to water and aquatic inhabitants could occur from wildland fire suppression and could include the following: introduction of fire retardant, aviation fuel, or lubricants into streams and wetlands; erosion of exposed soils from fireline construction on steep slopes adjacent to streams; damaged riparian vegetation and soils (resulting in erosion) from the use of heavy equipment and establishment of fire camps; and reduced natural stream flow during drafting and pumping. These impacts would adversely impact water quality of various fisheries throughout the Salt Lake planning area. The collective short-term impacts of increased sedimentation (from erosion) could have watershed-wide effects including changes in temperature, turbidity, and water chemistry. However, RPMs that were developed for riparian and wetland habitat and specific special status species would minimize the potential for short-term adverse impacts to aquatic species and their habitat. Additionally, because RPMs would ensure limited acres of prescribed fire and would impose constraints on non-fire fuel treatments in and adjacent to riparian and wetland and water habitats, short-term adverse impacts from these fire management activities would be minimized or eliminated.

Long-term Effects on Special Status Species

General Long-term Effects on ESA-related and BLM Sensitive Species

With wildland fire suppression, prescribed fire, and non-fire fuel treatments being used to minimize hazardous fuel loading and restore or maintain ecological component, vegetation communities and wildlife habitats would transition over time to more closely reflect conditions associated with a habitat's natural FR. This would create a more balanced (diverse) and resilient ecosystem that would have a reduced threat of severe wildland fire. This long-term beneficial effect would provide for greater species diversity in a more fire-tolerant ecosystem. Because prescribed fire would not likely consist of large fires, and rehabilitation would be implemented as necessary and appropriate, mortality or long-term displacement of species would likely be avoided. If management activities were implemented repeatedly within the same treatment area (e.g., mechanical treatment followed by prescribed fire followed by a seeding treatment), populations could be displaced over the long-term. However, to the extent that suitable habitat is available nearby, these impacts would be offset by the beneficial re-introduction of habitat conditions consistent with a natural FR.

Implementation of RPMs would minimize or prevent negative long-term effects to habitat quality or quantity. For many species, long-term negative effects could be greater from wildland fire itself, rather than from wildland fire suppression operations. The following beneficial effects on special status species could occur from wildland fire suppression:

- Federally protected species and their designated critical habitat could benefit from wildland fire suppression actions that would prevent the loss of designated critical habitat or suitable habitat from severe wildland fires.

- Federally protected species and their designated critical habitat could experience positive effects from ESR or seeding efforts.

Even so, suppression-related actions have the highest potential (of all fire management actions) for negative effects on special status species because RPMs would not necessarily be fully implemented due to risks to firefighter and/or public safety, and the nature of emergency suppression actions sometimes requires quick response without detailed, site-specific data or analysis.

Long-term adverse impacts on federally protected species and their designated critical habitat could occur from inadvertent mortality of individuals or long-term changes (alteration, removal, damage, or fragmentation) to suitable habitat components.

For situations where extensive or aggressive fire suppression would be appropriate, or when species or habitat components would have a long recovery rate, long-term adverse impacts could occur. For example, short-term effects could become long-term effects when a species has relatively few individuals, is extremely localized, is specialized in its habitat, or has a slow reproductive rate. Furthermore, direct mortality of individuals in small or endemic populations, or alteration of potentially suitable habitat, could cause long-term adverse impacts t the populations. Because wildland fire suppression operations are typically localized, even under extreme conditions, this activity would generally not affect wide-ranging species in the long-term, unless they have a low reproductive rate.

Long-term impacts on key habitat components that could affect the ability of a special status species to continue occupying a site, could include the following:

- Damage, removal, or fragmentation of nesting, roosting, foraging, dispersal, or cover habitats for terrestrial wildlife.
- Long-term changes in water quality or quantity; removal of riparian or upland vegetation, or downed woody debris; increased surface run-off; or introductions of disease or non-native, predatory species (in reference to fish and other aquatic species and their habitats).
- Extensive or severe damage to seedbanks, substrates, vegetative composition, or structure of habitats for plant species.
- Long-term changes in prey populations when key habitat components are slow to recover.
- An increase in invasive plant species that could out-compete federally protected plant species or alter sensitive (or non-fire adapted) habitats of terrestrial wildlife species following fire suppression. RPMs would typically minimize this potential effect and prevent it from becoming a long-term impact.

Pre-planning (including pre-project surveys and consultation with the USFWS) and implementation of RPMs would typically prevent mortality of individual species during implementation of prescribed fire and non-fire fuel treatments. These actions would minimize or prevent alteration of, damage to, removal of, or fragmentation of key habitat components within designated critical habitat or suitable habitat for special status species. Thus, long-term adverse impacts to species or suitable habitat would generally be avoided or limited in scope and/or intensity.

Conversely, if key habitat components were targeted for permanent change in structure or composition by fire management or resource objectives (e.g., restoration of altered habitats or historical fire regimes), long-term effects could be adverse or beneficial for a species, depending upon its particular habitat needs. Short-term effects from prescribed fire or non-fire fuel treatments could become long-term impacts by the same means as those listed for wildland fire suppression impacts.

Long-term impacts on key habitat components due to prescribed fire are the same as those listed above for wildland fire suppression. In some cases, long-term beneficial effects could potentially benefit species' reproduction, numbers, or distribution, facilitating the return of a species to its historic range. Long-term

beneficial effects to species could result from (1) decreased risk for large, severe fire events through fuels reduction and the gradual transition to a more natural FR, or (2) restoration of habitats that have been altered by either invasion of non-native species or long-term exclusion of fire (in fire-adapted vegetation communities).

Long-term Effects on ESA-related and BLM Sensitive Species Habitat

Salt Desert Shrub: Long-term impacts would include a beneficial stabilization of the ecosystem, with a decreased risk of severe fire.

Pinyon and Juniper Woodland: Long-term beneficial effects would include the transition to a more stable ecosystem with less risk of severe wildfire. Accordingly, net long-term impacts would be beneficial.

Sagebrush: Long-term impacts would include expanded acreage of high-elevation sagebrush habitat (from removal of pinyon and juniper woodland) and an overall transition to a lower condition class within both low- and high-elevation sagebrush habitats. Because this transition would indicate a lower risk for severe wildfire, these impacts would be beneficial to species and habitat associated with sagebrush.

Mountain Shrub: Long-term impacts to mountain shrub habitat and its associated species would be beneficial. Prescribed fire, non-fire fuel treatments, and post-fire seeding would begin to restore a more diverse mountain shrub ecosystem, trending it toward a lower condition class with lower risk for severe wildfire. Additionally, this habitat would be diversified and a more extensive ecosystem would result.

Mixed Conifer: Because the long-term effects of the proposed project would eventually produce a more stable ecosystem with a lower condition class, lower risk of severe wildfire would result. These impacts would be beneficial to mixed conifer habitats and associated species.

Riparian and Wetland: Long-term impacts would be beneficial and include a more diverse ecosystem with a reduced risk for severe wildland fire.

Aspen: Fire management actions would serve to lower the existing condition class and, subsequently, reduce the risk of a severe wildland fire. Additionally, fire management actions within mixed conifer habitat could increase the aspen component. Collectively, fire management actions within mixed conifer and aspen habitats could increase overall aspen habitat throughout the Salt Lake planning area. These impacts would be beneficial to special status species and the aspen habitats with which they are associated.

Water: Long-term impacts to water and aquatic inhabitants would be beneficial. With a reduced risk for severe wildland fire in upstream and adjacent habitats, the ecosystems would be less likely to suffer watershed-scale adverse impacts from fire that could reduce or eliminate any entire populations of some aquatic species.

4.2.3 WATER QUALITY

Short-term Effects on Water Quality

Surface Water

Under the Proposed Action Alternative, the potential slight increase in wildland fire acres could increase runoff, erosion and stream temperatures. Nutrient concentration and turbidity increases in surface waters through increases in erosion and runoff, which carry nutrients and excess sediment into water courses from burned areas are possible.

The use of prescribed fire and non-fire fuel treatments could decrease slightly under the Proposed Action Alternative from current levels. Vegetation disturbance associated with these actions would be evaluated through environmental analysis that would minimize impacts related to increases in surface runoff, soil loss and sediment input to surface waters. Often these impacts are short-term and return to pre-fire levels once vegetation is re-established.

Figure 4.1 presents the location of 303(d)-listed waterbodies located in the planning area relative to FMUs categorized by relative desirability of wildland fire in the FMU (Categories A through D). Most 303(d)-listed streams in the planning area are located along the Wasatch Front in the Bear River, Weber River, Jordan River, and Uinta Basin watersheds. A large fraction of the 303(d)-listed impaired waters in the planning area are not located on BLM-administered land, and those that are located on BLM-administered land are primarily located in FMUs where wildland fire is generally not considered desirable (Categories A and B). Wildland fire suppression efforts and planned fuel reduction projects would have minimal impacts on impaired waters through implementation consistent with compliance strategies for restoring or maintaining the restoration of water quality impaired [303(d) listed] waterbodies. Proposed RPMs would restrict activities in the vicinity of sensitive areas such as impaired waterbodies (i.e., 303(d)-listed) in order to reduce further degradation of the surface water conditions.

The Proposed Action Alternative would allow more flexibility in planned activities to manage fuel loads and would implement RPMs to reduce potential effects to water resources. Potential impacts on water resource issues would be considered before implementing prescribed burns, non-fire fuel treatments, or seeding efforts.

Groundwater

Minor impacts on groundwater quality due to the Proposed Action Alternative are possible due to altered water absorption patterns from a decrease in vegetation cover following wildfire or fuel treatments and from soil compaction due to mechanical equipment. Additionally, infiltration could temporarily decrease after a fire due to the formation of a hydrophobic soil layer. Altered water infiltration rates could also potentially temporarily increase or decrease the chemical levels (i.e., dissolved solids) in shallow aquifers (Gee et al. 1992, Allison et al. 1994). The impact to groundwater would be dependent on the depth to groundwater below ground surface and the type of sediments or bedrock it passes through. The change in the infiltration capacity of the soil would be dependent upon the fire's severity, soil type, and vegetation's ability to reoccupy the site following fire.

Long-term Effects on Water Quality

Surface Water

Wildland fires would be smaller and less severe resulting in fewer impacts to storm flows and nutrient and sediment loads. A trend towards fewer severe wildfires would increase soil stability and would enhance overall streambank and channel stability and Proper Functioning Condition of the watershed. Some areas would see a more sustainable supply of woody debris or streambank vegetation, which would also increase bank stability.

Planned fire actions and mechanical treatments that would lead to the eventual restoration of natural fire regimes, under the Proposed Action Alternative, would improve water resources by reducing the risk of high severity wildfire and promoting native vegetation types. The Proposed Action Alternative would also reduce erosion potential in the long-term by fostering a healthy, native understory. The Proposed Action Alternative would allow more flexibility in implementing and timing planned actions that would protect water resources.

Groundwater

A trend toward fewer large, severe wildfires, that otherwise may cause damage to soil resources and possible resultant impacts to groundwater, would occur. This is related to a reduction in the alteration of infiltration rates and would be realized through more vegetation surface cover and root zone presence and less fire-caused hydrophobicity.

4.2.4 WETLANDS AND RIPARIAN ZONES

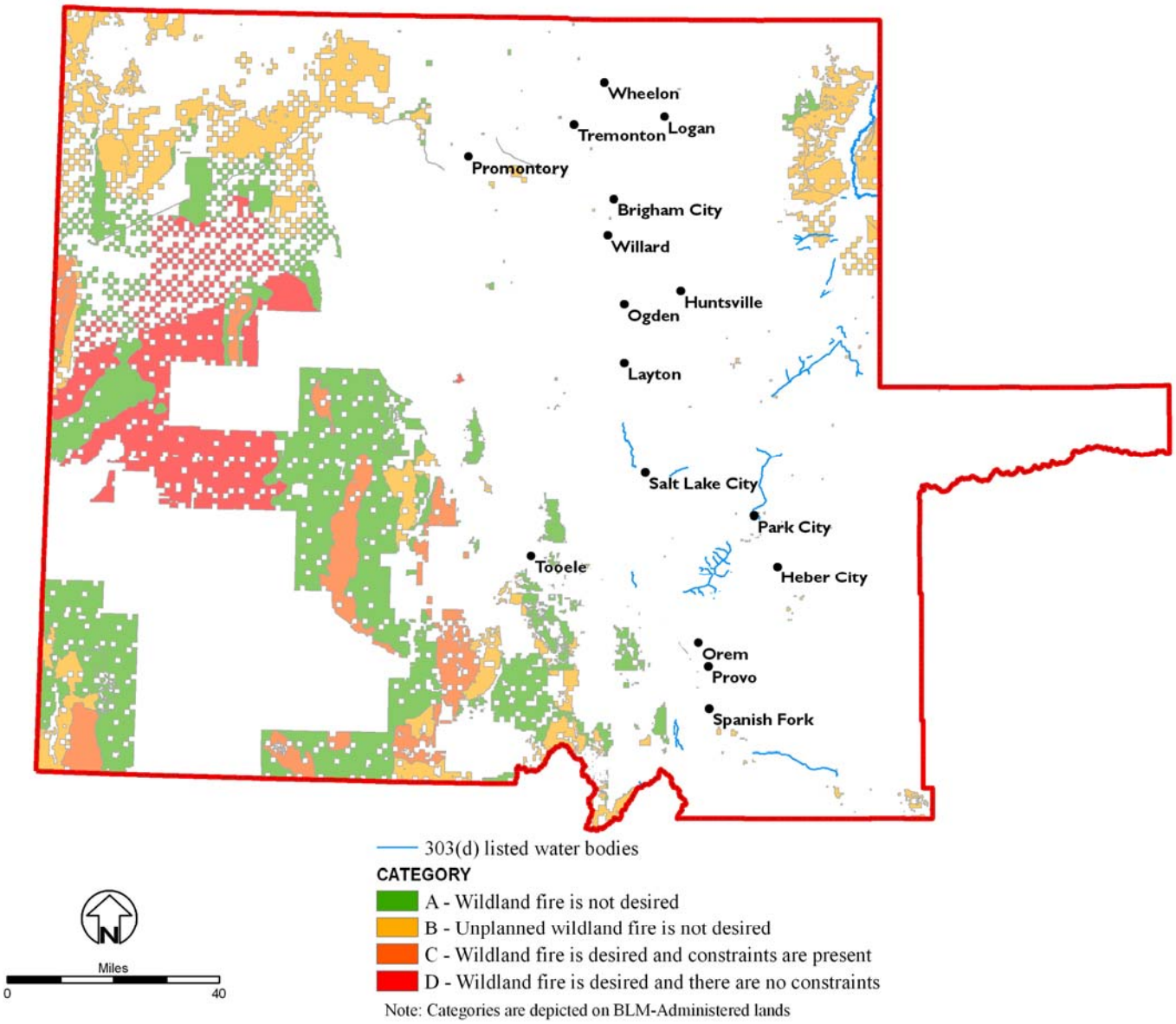
Short-term Effects on Wetlands and Riparian Zones

The Proposed Action Alternative includes RPMs that would help protect wetlands and riparian zones. However, the potential exists for wildland fire suppression, following AMR protocol and other fire management actions to impact wetland and riparian resources. Riparian areas are found throughout the planning area and in all suppression categories. However, fires in riparian areas are generally not desired and would be suppressed, with a few small, low intensity fires being allowed to burn.

Under the Proposed Action Alternative, the burning of riparian and wetland areas would generally be avoided, however, low intensity fires may be allowed to burn with some suppression control to reduce the likelihood of a severe fire which would cause greater damage to those areas. This would minimize impacts to riparian functions and values from wildland fire. Proposed RPMs would restrict suppression activities in the vicinity of sensitive areas such as wetland and riparian areas. Short-term impacts of suppression activities could include vegetation damage or destruction, increased streambank and shore erosion, and increased sedimentation in streams that degrades fish habitat and water quality. The loss of streamside vegetation could result in an increase in stream temperature resulting in degradation of fish and other aquatic species habitat. Additionally, nonnative species found in the planning area generally recover faster than native species after a disturbance. These potential impacts on riparian areas would be minimized by AMR at the time of ignition and throughout the fire event.

Vegetation disturbance associated with these actions would be evaluated through an environmental planning and review process that would minimize impacts related to vegetation loss and increased erosion. Often these impacts are short-term and conditions return to pre-fire levels once vegetation is re-established. Efforts would be made to protect vegetation and restore native species after a disturbance.

FIGURE 4.1: 303 (D) – LISTED WATERBODIES AND FIRE MANAGEMENT CATEGORIES ON BLM-ADMINISTERED LAND



Long-term Effects on Wetlands and Riparian Zones

Potential for long-term beneficial impacts to riparian and wetland areas would be greater under this alternative in comparison to current management. Overall, conditions would improve through the removal of undesirable vegetation, lessening the chances of high severity wildfire, and promoting native vegetation types.

Wildland fires would be smaller and less severe resulting in fewer impacts to vegetation and sediment loads. A trend towards fewer severe wildfires would increase soil stability and would enhance overall bank and channel stability and proper functioning condition of the watershed. Some areas would see a more sustainable supply of woody debris or streambank vegetation, and increase bank stability. Riparian areas would have fewer disturbances from severe wildfires, allowing greater stability and increased functionality of floodplains, including reducing impacts from flashfloods.

Planned fire management and fuels reduction actions would improve riparian resources and reduce erosion potential in the long-term by fostering a healthy, native understory. The Proposed Action Alternative would allow more flexibility in implementing and timing planned management actions that would protect water resources.

4.2.5 WILDERNESS STUDY AREAS

Short-term Effects on Wilderness Study Areas

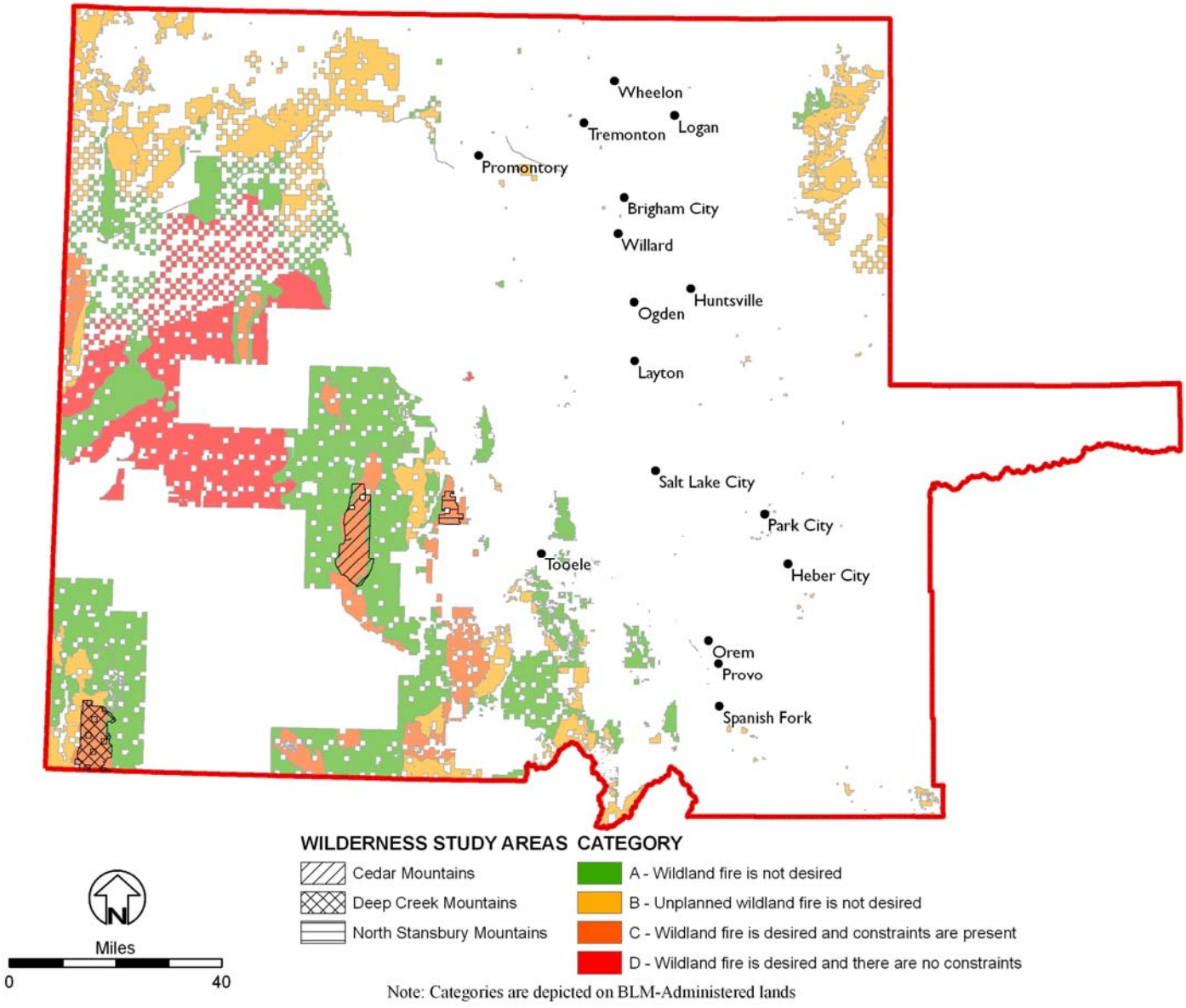
The majority of WSAs, 89 percent, would lie within Category C designated FMUs Eleven percent would be within Category A FMUs, and less than one percent would be found within Category B lands. In all categories, management activities would minimize or not impair wilderness suitability.

Full suppression of wildland fires may be implemented to control fire size and severity within thus protecting resource values as well as any safety concerns upon adjacent lands.

Though minimized by following wilderness study area management guidelines and implementing RPMs associated with the Proposed Action Alternative, short-term impacts on wilderness characteristics resulting from management response to wildland fire efforts may still include ground disturbances associated with suppression and control efforts (e.g., hand lines, vehicle tracks, and spike camps). Impacts would occur to actual physical resources including vegetation, soils, watersheds, etc., which are discussed in their respective sections. Due to the increased emphasis on suppression, those WSAs within Category A FMUs would likely see more short-term impacts from suppression activities than those lands in Category C FMUs. Fewer acres of land would be burned on acres in Category A and B FMUs acres than in Category C FMUs. This increase in suppression efforts and decrease in wildfire seen in Categories A and B would affect vegetation conditions, habitat, air quality etc. in WSAs.

Seeding may be prioritized after suppression within a WSA to stabilize soils, minimize the threat of invasive and noxious weed species, and to preserve natural and unique values. Stabilization efforts may be noticeable after fire events as the areas become re-vegetated. Suppression and restoration efforts would be designed, to avoid impairment of wilderness character values, thus would not likely to impact wilderness values or impair the area's suitability for preservation as wilderness.

FIGURE 4.2: WILDERNESS STUDY AREAS AND FIRE MANAGEMENT CATEGORIES ON BLM-ADMINISTERED LAND



Note: Categories are depicted on BLM-Administered lands

All planned management activities, including prescribed fires, would undergo a site-specific environmental evaluation to determine potential impacts to the resource prior to being approved.

Prescribed burning could be used in WSAs where appropriate and necessary to maintain fire-dependent natural ecosystems. Prescribed fire activities in WSAs would not be conducted if impacts would adversely impact wilderness values or suitability for preservation as wilderness, therefore, short-term impacts on naturalness would be similar to an AMR and seeding efforts.

Non-fire fuel treatments would not be conducted in the WSA if it could adversely impact wilderness values or impair the area's suitability for preservation as wilderness so there would likely be no impacts to the eligibility of the area. No chemical, mechanical, or biological means of treatment would be allowed in the WSA, so there would be no impacts from these types of actions.

Rehabilitation actions in WSAs would be conducted in a manner so as not to impair the area's suitability for preservation as wilderness so there would likely be no impacts to the eligibility of the area. There would be no negative impacts from seeding efforts, as all seeding efforts would be hand or aerial seeded minimizing any surface disturbance. The naturalness of the area would be preserved and enhanced by using appropriate species in seeding.

Exceptions to the use of non-motorized equipment in WSAs must be fully justifiable based upon an imminent and severe threat to high priority values.

Opportunities for solitude and primitive and unconfined recreation may be restricted (e.g., access and direct use) or impaired (e.g., air quality and visibility) during naturally-ignited and planned fire events. However, these impacts on the quality of visitor experience would be limited to the burn area and duration and likely would not affect overall use and opportunities for these values in other portions of the areas.

Long-term Effects on Wilderness Study Areas

The Proposed Action Alternative would trend the current condition to a DWFC that would be more historically representative of the natural vegetation cover. Long-term effects associated with the application of an AMR to naturally-ignited wildland fires and actions associated with planned prescribed fire and non-fire fuel treatments would be beneficial. These long-term beneficial effects (movement toward natural fire regime and reduced severity of fire events) would outweigh any short-term adverse impacts to naturalness or access to opportunities of solitude and primitive recreation.

4.2.6 LIVESTOCK GRAZING

Short-term Effects on Livestock Grazing

The primary purpose of fire management actions on rangelands within the Salt Lake planning area is to reduce fuels and the cover of encroaching undesirable vegetation species. Increased production, nutrient quality, and palatability of herbaceous plants are typically observed after a burn in areas with herbaceous vegetation. Fire breaks up large tracts of sagebrush, pinyon, and juniper dominated landscapes and establishes a mosaic of vegetation types. The creation of openings and more nutritious, palatable forage would benefit livestock and result in minor to moderate shifts in livestock utilization and distribution patterns.

Aggressive suppression may be used in areas susceptible to cheatgrass invasion and expansion, giving the Proposed Action Alternative the flexibility to limit impacts associated with invasive species. Wildland fire also has the potential to destroy allotment improvements including but not limited to corrals, fences, water supply structures, livestock death, and sheds.

The greatest impact on grazing after a wildland fire is the temporary loss of allotment use. Grazing would be curtailed on burned areas for a minimum of one growing season if the rangeland is not reseeded, or a minimum of two growing seasons if the rangeland has been reseeded. This reduction in grazing could cause negative economic impact on the permittee and the need to find alternative grazing or feeding arrangements. The need for management of livestock use on a burned area is most critical the first growing season after fire, particularly in plant communities of arid and semiarid regions (Trlica 1977).

Prescribed fire actions and non-fire treatment actions would be coordinated with the grazing permittee to reduce impacts from the loss of grazing us. A net benefit to desirable vegetation composition following prescribed fire would occur following the recovery period. Pre-fire rest from grazing is required on many range sites to allow the accumulation of enough fine fuel to carry a prescribed fire (Jones and DeByle 1985).

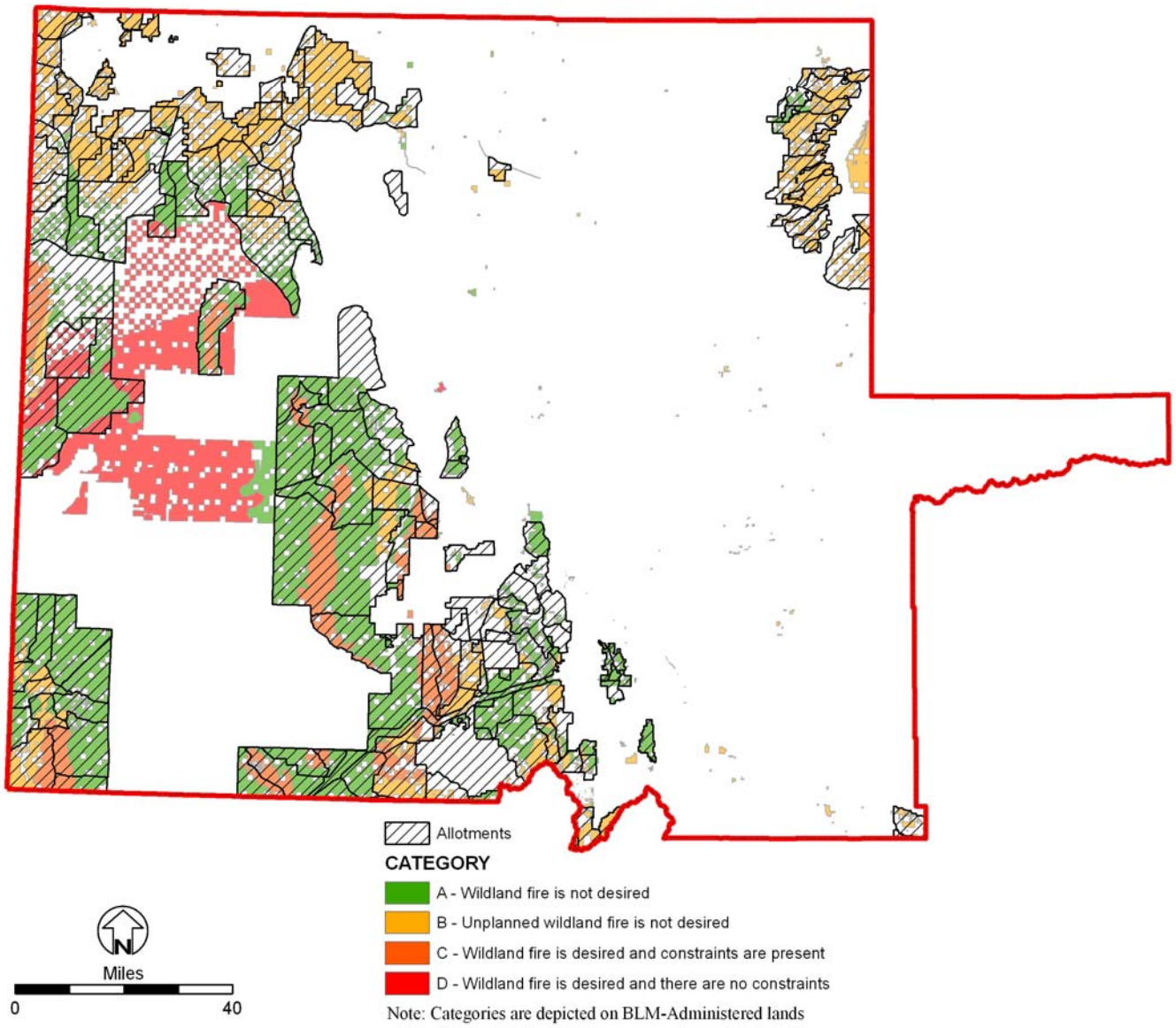
Non-fire fuel treatments including mechanical actions and seeding where a vegetation composition change is desired would impact permittees by eliminating grazing from an allotment for a minimum of two years. Post-recovery use of the grazing allotment would benefit through improved forage composition.

Figure 4.3 presents the locations of the grazing allotments relative to fire management categories and their associated impacts from wildland fire suppression and wildland fire.

Under the Proposed Action Alternative, approximately 52 percent of grazing allotments fall into Category A, 31 percent in Category B, 13 percent in Category C, and four percent in Category D. As indicated by the category breakouts, the majority of grazing allotments are located in areas where wildland fire management goals are focused on minimizing wildland fire. The No Action Alternative has a similar wildland fire management goal. Long-term Effects on Livestock Grazing

Long-term impacts from an increase in wildland fire suppression acreage goals in the Proposed Action Alternative are expected to make grazing resources more productive and stable. The removal of hazardous fuels would reduce the risk of severe wildfire, which would decrease the likelihood that such an event would result in longer recovery periods for impacted allotments. Prescribed fire and non-fire treatments would affect a similar trend toward increases in ecosystem health and stability, result in improvement of grazing resources, and reduce the potential for longer recovery periods. This would be particularly evident in FMUs with cheatgrass infestation problems.

FIGURE 4.3: GRAZING ALLOTMENTS AND FIRE MANAGEMENT CATEGORIES ON BLM-ADMINISTERED LAND



4.2.7 WOODLAND AND FORESTRY

Short-term Effects on Woodland and Forestry

In the short-term, the change in suppression efforts is not expected to reduce the acreage of pinyon and juniper woodland that has encroached outside of its historical range enough to noticeably reduce the availability pinyon and juniper products. Forested areas are expected to experience similar impacts to current conditions with the exception of areas in condition class 2 where suppression efforts would potentially be less aggressive.

The use of prescribed fire in forests and woodlands could be accompanied by non-fire fuel treatment methods to bring the areas to a lower condition class level and reduce associated burn severity. In the short-term, this would increase the opportunity for the harvesting of biomass and firewood.

The use of non-fire treatment methods to reduce the occurrence of younger age classes in areas of old growth could increase the survivability of old growth forests during fire events (Howard 2003). This could increase the availability of higher economic value forest products, particularly in mixed conifer.

Long-term Effects on Woodland and Forestry

Long-term impacts from the wildfire suppression efforts would include a reduction in the acres of pinyon and juniper woodland encroaching on land outside of its historic range and acres within its historic range where they have become the dominant species. This would directly decrease the availability of biomass and firewood collection in this vegetation type. This impact would be less pronounced in the mixed conifer forests in the planning area.

Prescribed fire and non-fire treatments would initially result in an increase in the opportunity for the harvesting of biomass and firewood.

4.2.8 VEGETATION

Short-term Effects on Vegetation

Salt Desert Shrub: Eighty percent of this vegetation type would be in Category A FMUs, 13 percent in Category B FMUs, and three and four percent in Categories C or D FMUs, respectively.

As with all vegetation types, wildland fire suppression has the potential to disturb this vegetation type due to fireline construction or other initial attack actions, in addition to the impacts from the fire itself and follow-up rehabilitation. When ESR actions are applied and RPM are followed for the prevention invasive species (see **Appendix E**); cheatgrass and noxious weed invasion would be reduced by the appropriate vegetation being seeded. Because noxious weed and cheatgrass invasion are the main reasons that the vegetation type is in condition class 2 or 3, ESR should improve the conditions and possibly reduce the condition class.

Very little (only incidental, isolated patches) of this vegetation type occurs in areas where prescribed fire would be considered. Consequently, the damaging effects fire has on this type (invasion of noxious weeds and lack of post-fire regeneration) would be avoided. When planned carefully, fire and ESR would also reduce the risk of nonnative species invasion.

Non-fire fuel treatments could be used effectively to reduce the cheatgrass invasions occurring in these vegetation types. Because noxious weed and cheatgrass invasion are the main reasons that the vegetation type is in condition class 2 or condition class 3, non-fire fuel treatments should improve the conditions and reduce the condition class.

Sagebrush: Of this vegetation type, 22 percent would be in Category A FMUs, 67 percent in Category B FMUs, and 11 percent in Category C FMUs. None of the vegetation type would occur in Category D FMUs.

Wildland fire suppression has the potential to disturb this vegetation type due to fireline construction or other initial attack actions, in addition to the impacts from the fire itself. When ESR actions are applied and RPMs are followed for the prevention of invasive species (see **Appendix E**), cheatgrass and noxious weed invasion would be reduced. Noxious weeds and invasive species are the main reasons that this vegetation type is nearly all in condition class 3. ESR actions should improve the conditions and possibly reduce the condition class. Although basin big sagebrush, Wyoming big sagebrush, and mountain sagebrush do not re-sprout after fire, these species are prolific producers of seed and if a seed source is present, re-establishment after fire is quite rapid.

Prescribed fire may be used in this type to increase sagebrush age class diversity, encourage sprouting of herbaceous species and sagebrush, remove encroaching pinyon juniper, and encourage seedlings to sprout (Paysen et al. 2000). Noxious weed and cheatgrass invasion are the main reasons that this vegetation type is nearly all in condition class 3; RPMs would encourage the area to possibly move toward a lower.

Non-fire fuel treatments could be used effectively to reduce the cheatgrass invasions and encroaching pinyon juniper occurring in these vegetation types. Because noxious weed and invasive species are the main reasons that nearly all (97 percent) of the vegetation type is in condition class 3, non-fire fuel treatments should improve the conditions and reduce the condition class.

Pinyon and Juniper Woodlands: Of the pinyon and juniper woodlands, 18 percent would be in Category A FMUs, 31 percent in Category B FMUs, and 51 percent in Category C FMUs. None of the vegetation type would occur in Category D FMUs.

Wildland fire suppression has the potential to disturb this vegetation type due to fireline construction or other initial attack actions, in addition to the impacts from the fire itself. When ESR actions are applied and RPMs are followed for the prevention of invasive species (see **Appendix E**), cheatgrass and noxious weed invasion would be reduced.

This vegetation type is largely in condition class 3 (68 percent) mainly due to encroachment of juniper into grassland or sagebrush types from fire suppression, cheatgrass establishment, and lack of native understory vegetation. Prescribed fire would reduce acres of juniper encroachment and reduce the density of pinyon and juniper woodlands. Prescribed fire would probably be lethal to many small or young juniper trees.

Non-fire fuel treatments would reduce densities of juniper and pinyon, improve understory vegetation, and would consequently reduce fuel loads. These treatments would also likely reduce invasion of cheatgrass.

Mountain Shrub: Of this vegetation type, 62 percent would be in Category A FMUs, 27 percent in Category B FMUs, and 11 percent in Category C FMUs. None of this type would occur in Category D FMUs.

Wildland fire suppression has the potential to disturb this vegetation type due to fireline construction or other initial attack actions, in addition to the impacts from the fire itself. Mountain shrub is at high risk of cheatgrass invasion following fire. ESR would reduce the risk of cheatgrass invasion following fire. Many species in the mountain shrub type can re-sprout or reseed following fire, and effects of fire on the vegetation type would be a reduction of available fuels, and an increase in age-class and species diversity.

Effects from prescribed fire would be much the same as wildland fire suppression. RPM to reduce invasive species would reduce the risk of cheatgrass invasions. Many species in the mountain shrub type can re-sprout or reseed following fire, and effects of fire on the vegetation type would be a reduction of available fuels.

Non-fire fuel treatments would reduce fuel loadings the risk of cheatgrass invasion, and increase age-class diversity.

Mixed Conifer: The mixed conifer vegetation type occupies less than one percent of the BLM-managed lands in the planning area. Of this vegetation type, 32 percent would be in Category A FMUs, 26 percent in Category B FMUs, and 42 percent in Category C FMUs. None of the vegetation type would occur in Category D FMUs.

Wildland fire suppression has the potential to disturb this vegetation type due to fireline construction or other initial attack actions, in addition to the impacts from the fire itself. The mixed conifer type frequently benefit from fire. Effects of suppression on this type could include a reduction in fuel loadings and tree density. These effects increase the nutrients and water available to remaining plants and reduce the severity of future fires. Aspen would particularly respond well to most applications of fire.

Prescribed fire is very effective at reducing fuel loadings and densities on mixed conifer sites. Effects from prescribed fire would be much the same as wildland fire suppression. Aspen regenerates after fire.

Non-fire fuel treatments would reduce fuel loadings in this vegetation type, and reduce the risk of noxious weed and cheatgrass invasion.

Long-term Effects on Vegetation

All Vegetation Types

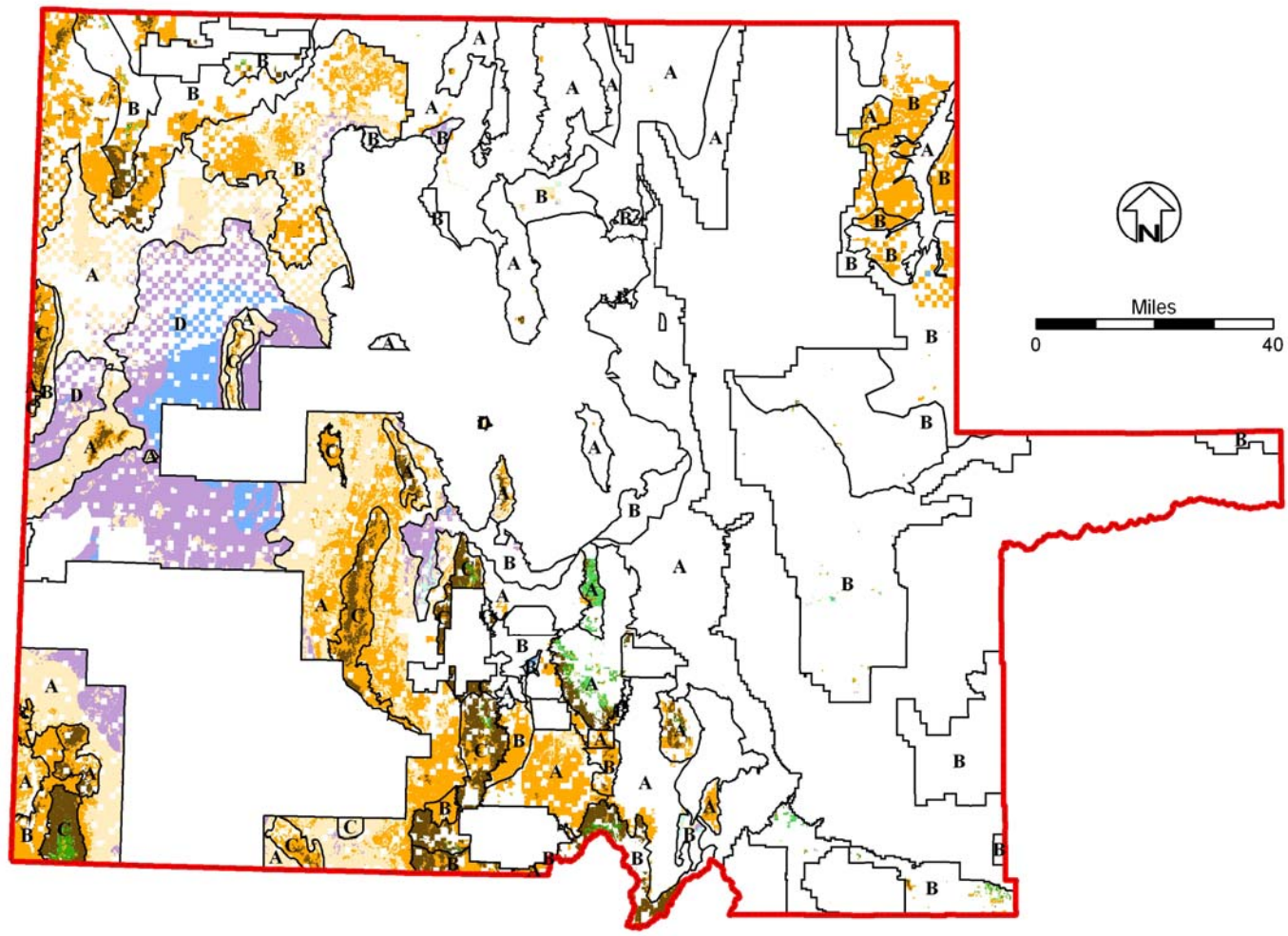
All vegetation types would exhibit long-term reductions in fuel loadings, risk of invasion from noxious weeds and cheatgrass, and increased age-class diversity. Overall, the proposed action would result in a reduction in condition class. Many of these long-term beneficial effects are a result of ESR, seeding, and RPMs applied as part of the Proposed Action Alternative.

Where management actions occur, a long-term improvement in condition class would result in less risk of wildland fires burning outside their natural range of variability in terms of fire behavior, size, severity, and frequency. A more natural fire regime (fire return interval and severity) would benefit all vegetation types found in the Salt Lake planning area.

4.2.9 FISH AND WILDLIFE

Some of the goals of the Proposed Action Alternative are to restore historical habitats and native plant species, and to enhance, maintain, and protect ecological resources. These would likely be accomplished through the implementation (post-wildland fire or post-treatment) of rehabilitation activities, where practical and applicable, thereby resulting in long-term, beneficial effects.

FIGURE 4.4: VEGETATION TYPES AND FIRE MANAGEMENT CATEGORIES ON BLM-ADMINISTERED LAND



Note: Vegetation type is shown on BLM-administered lands.

Short-term Effects on Fish and Wildlife

RPMs (**Appendix E**) were built into the Proposed Action Alternative in order to minimize or eliminate adverse effects on species and habitat. RPMs (e.g., consistency of scheduling non-fire fuel treatments outside of the nesting season for raptors) would be implemented during wildland fire suppression activities, prescribed fire, and non-fire fuel treatments, as applicable. The following discussion describes potential effects on species and habitat.

Fish

RPMs included in the Proposed Action Alternative would limit the potential for impacts on fisheries and aquatic resources. However, direct effects could occur from wildland fire suppression, including the introduction of fire retardant, aviation fuel, or lubricants into streams and wetlands; erosion of exposed soils from fireline construction on steep slopes adjacent to streams; damaged riparian vegetation and soils (resulting in erosion) from the use of heavy equipment and establishment of fire camps; and reduced natural stream flow during drafting and pumping. These impacts would adversely impact water quality of the various fisheries throughout the Salt Lake planning area. The collective short-term impacts of increased sedimentation (from erosion) could have watershed-wide effects including changes in temperature, turbidity, and water chemistry.

Because RPMs would ensure limited acres and severity of prescribed fire, as well as constraints on non-fire fuel treatments in and adjacent to riparian and wetland and water habitats, short-term adverse impacts from these fire management activities would be minimized or eliminated.

Non-game and Big Game Species

Short-term adverse impacts (e.g., direct mortality, habitat destruction, and displacement) on non-game and big game species would be minimized by RPMs, as well as ESR and other seeding activities that would be conducted, as practical and necessary, in treatment areas. However, fire management activities could still result in short-term adverse impacts. These impacts would likely affect suitable habitat used by raptors, migratory birds, small mammals, carnivores, amphibians, reptiles, and a variety of big game species.

Direct effects from wildland fire suppression could include damaged vegetation (including forage resources) from the use of heavy equipment and establishment of fire camps, weed invasion, and increased size of an undesirable habitat type. Direct effects from prescribed fire and non-fire fuel treatments could include mortality to individual animals, modification or destruction of forage or prey resources, habitat alteration or damage, and species displacement.

Big Game: Approximately 20 percent of mule deer habitat, 8 percent of Rocky Mountain elk habitat, and 27 percent of Rocky Mountain big horn sheep habitat associated with critical seasonal use areas could be affected by prescribed fire and/or non-fire fuel reduction treatments. All critical seasonal use areas could be affected by suppression activities.

Raptors and Migratory Birds: Raptors found in mountainous and forested habitats (e.g., mountain shrub and mixed conifer), and migratory birds that generally breed at higher elevations would likely incur few short-term impacts because these habitats more closely reflect a natural fire regime and, therefore, would likely be a lower priority for prescribed fire and non-fire fuel treatments. Raptors and migratory birds that are found within salt desert shrub and riparian and wetland habitats would be more likely to incur impacts from prescribed fire and non-fire fuel treatments because these habitats are relatively far-removed from their natural fire regime and would likely be prioritized for fire management activities. However, because RPMs

would be considered and implemented as appropriate for planned fire management actions, direct impacts would be limited to those associated with wildland fire suppression. Those impacts would include direct mortality, habitat destruction, and displacement. Indirect impacts could include a short-term reduction in available prey sources.

Small Mammals: Because small mammal habitats would be prioritized differently for fire management activities (based on their relative likeness to the natural fire regime for that habitat), impacts on small mammals would vary across the planning area.

Carnivores and Predators: Carnivores and predators that occur in mountainous and forested habitats would be less likely to incur short-term adverse impacts than those found in some other habitats (e.g., coyotes in pinyon and juniper woodlands). Impacts could include direct mortality, habitat alteration or destruction, displacement, and a reduction in food sources.

Amphibians and Reptiles: Amphibians and reptiles in the planning area are found in salt desert shrub and riparian and wetland habitats. Areas where the salt desert shrub type is far-removed from the natural fire regime would likely be prioritized for prescribed fire and non-fire fuel treatments. Amphibians and reptiles in these areas could incur short-term adverse impacts including direct mortality, habitat destruction, and displacement. However, because RPMs would be considered and implemented as appropriate for planned fire management actions, direct impacts would be limited to those associated with wildland fire suppression activities.

Long-term Effects on Fish and Wildlife

Fish

Long-term adverse impacts on fisheries and aquatic resources would be minimized or avoided by implementation of RPMs. Long-term beneficial impacts on fisheries would include an incremental reduction in the risk of severe wildland fire, as well as a reduction in adverse impacts from wildland fire suppression activities.

Non-game and Big Game Species

The long-term effects of the Proposed Action Alternative on fish and wildlife species found within the Salt Lake planning area would be similar to the long-term effects described for special status animal species (see Section 4.2.2). Long-term effects are summarized below for the following species groups: raptors and migratory birds, small mammals, carnivores and predators, amphibians and reptiles, and big game.

With suppression, prescribed fire, and non-fire fuel treatments being used to minimize fuel loading, vegetation communities and wildlife habitats within the Salt Lake planning area would transition over time to more closely reflect conditions associated with a natural FR. This would create a more stable ecosystem in which the threat of an unnaturally severe wildland fire would be minimized.

Because prescribed fire would not likely consist of large fires, and because rehabilitation would be implemented as necessary and appropriate, mortality or long-term displacement of species would likely be avoided. If management activities were implemented repeatedly within the same treatment area (e.g., mechanical treatment followed by prescribed fire) populations could be displaced for longer periods. However, to the extent that suitable habitat were available nearby, these impacts would be offset by the beneficial reinstatement of a natural FR.

The establishment of noxious weeds would be minimized or eliminated due to the implementation of RPMs and stipulations in the Proposed Action Alternative (that allow for ground disturbing activities only in areas

where the threat of noxious weeds is minimal or where reseeding would likely be successful). As a result, a long-term effect on habitat would be a gradual increase in species diversity that would more closely reflect that associated with a natural FR.

Regardless of species or associated habitat, overall long-term effects on non-game and big game species and their habitat would be beneficial.

4.2.10 SOILS

Short-term Effects on Soils

Under the Proposed Action Alternative, it is likely that more acres of BLM-managed land would be affected by wildland fire than are currently. An increase in the loss of vegetative cover to wildland fire could affect soil quality through the loss of soil structure and temporary reduced porosity of soils in these impacted areas. This reduction in porosity and structure could result in a change in infiltration rates and increased erosion and runoff (Ralston and Hatchell 1971). RPMs associated with wildland fire suppression and fuels treatments would minimize direct effects to soil (such as the loss in soil structural stability or soil compaction), and would address indirect impacts associated with soil loss and the potential for sediment loading, sedimentation, and increased salinity. Erosion controls and revegetation may be proposed as post-fire treatments that would serve to contain and control soil loss and would serve to stabilize these sites.

Wildland fire suppression would be subject to an AMR, and an aggressive initial attack would be considered where expected fire severity could adversely impact sensitive soils. Indirect impacts include potential soil loss from wind and water erosion.

Long-term Effects on Soil

Wildland fire and suppression and associated ESR, prescribed fire, non-fire fuel treatments, and seeding would result in a trend toward less severe wildfires and fewer impacts to soil quality, including microbial and mycorrhizal communities, soil temperatures, and chemical and physical structure of the soil. The flexibility of the Proposed Action Alternative would continue to allow for high levels of suppression in areas with sensitive soils.

Under the Proposed Action Alternative, planned fire management and fuel reduction actions would be implemented to improve the soil resources and reduce erosion potential in the long-term by fostering a healthy, native understory. Planned prescribed fire and non-fire fuel treatments under the Proposed Action Alternative would continue to reduce the likelihood of severe wildfires that result in soil structure loss and altered porosity and infiltration rates. Over time, as fire returns to a more natural regime, there would be fewer indirect impacts from large, severe wildfires including potential sedimentation of streams and reservoirs from wind and water erosion and fugitive dust from wind erosion.

4.2.11 RECREATION

Short-term Effects on Recreation

As shown in **Figure 4.5**, recreation sites are found in FMUs with Categories A-D. Because the Proposed Action Alternative includes RPMs that would preferentially protect developed Special Recreation Management Areas (SRMAs) and recreation site infrastructure from wildland fire, any wildfire that presents a threat to a developed recreation site would be fully suppressed.

Recreation sites and infrastructure most likely to be impacted by wildfire and suppression efforts include trails and OHV routes, interpretive and directional signage, and dispersed camping areas. Visitor experience may also be affected by aesthetic qualities of the recreation area, degradation of air quality from smoke, and road, trail and route closures during and following wildland fire suppression. The most abrupt impact to potential recreationists is the complete or partial closure of recreation sites and facilities or even evacuation of those recreationists. If recreationists are allowed to enter or stay in the area, other impacts might include noise and visual impacts from ground equipment, helicopters, and air tankers delivering water, fire retardants, firefighting equipment, and personnel. Indirect impacts of wildland fire at developed facilities could include increased erosion and hazards associated with dead standing vegetation. Re-vegetation efforts could temporarily close areas to use.

The resultant impact would be lost visitor days at developed facilities. The RPMs implemented would decrease the potential for impacts to developed facilities. Higher value sites and facilities would take precedence for protection. However, under an AMR the emphasis for protection is placed on other resources, with human health and safety of firefighters and the public being the most important. Despite the potential negative impacts on developed recreation sites and facilities as a result of wildland fire, a positive impact would be the opportunity to educate the recreating public of the role of fire in the landscape (Silverman 1993).

Prescribed fire and non-fire fuel treatments could negatively impact the aesthetic quality of developed recreational sites and facilities. However, no impacts to the infrastructure or natural features at these sites are anticipated due to the planning required prior to implementation. Additional impacts from these actions may include temporary facility or site closures and the presence of crews performing the action. Aesthetic impacts would be temporary. Positive impacts include the removal of fuels, which left in place would create a wildfire danger to the site and facilities.

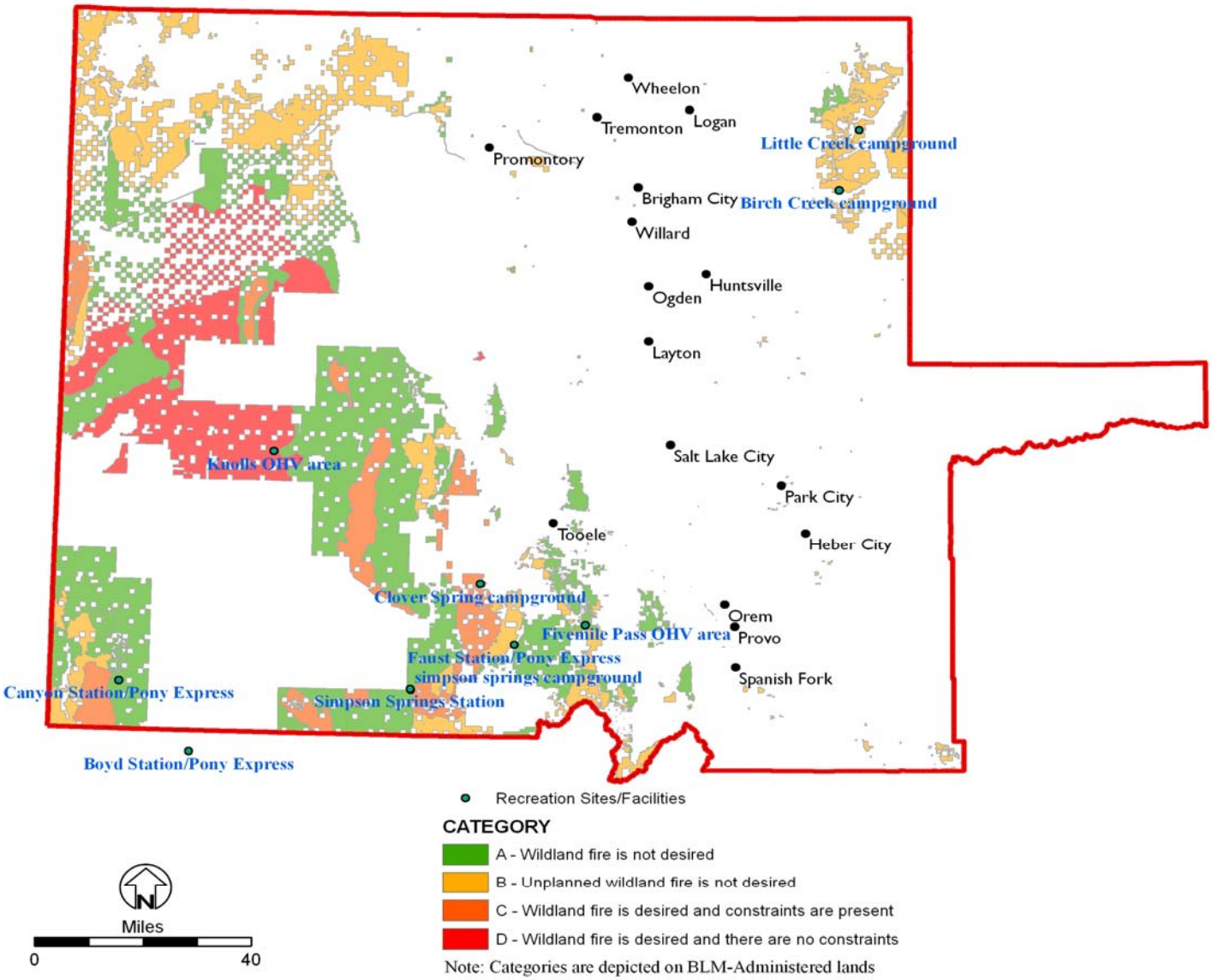
Long-term Effects on Recreation

Proposed fire suppression management direction may result in burning more of the surrounding vegetation, relative to the No Action Alternative, thereby creating aesthetic changes to the landscape. However, a trend toward DWFC and the associated reduced likelihood of severe fire events would make the potential for the loss of these resources and visitor use days less likely.

The movement of vegetation toward a DWFC would lessen the potential for wildland fire to be uncontrollable and more intense. This would enable the BLM to better protect developed recreation sites and visitors.

Prescribed burns as well as non-fire fuel treatments would reduce excess fuels in the planning area, which reduces the risk of large, severe wildland fire and the associated impacts to site use and characteristics (NPS 2000). The reduced fuel load makes it less likely that a wildfire would burn the entire site. This increases both the level of safety for recreationists and available visitor days.

FIGURE 4.5: RECREATION SITES AND FIRE MANAGEMENT CATEGORIES ON BLM-ADMINISTERED LAND



4.2.12 SOCIOECONOMICS

Short-term Effects on Socioeconomic Conditions

In the short-term, forest product values, allotment lessees, and air quality could be adversely affected by wildland fire suppression goals, prescribed fire and non-fire fuel treatments. Prescribed and wildland fires would create temporary decreases in air quality and displace livestock from foraging areas for one or more years. A temporary loss of allotment use could affect the lessees by decreasing revenue during the time that they are unable to utilize the allotment(s). Additional short-term effects could include altered transportation routes and disruption of subsistence activities. An increase in revenue for communities from increased utilization of local services during suppression activities and treatments could be realized.

Long-term Effects on Socioeconomic Conditions

Implementation of the Proposed Action Alternative in the Salt Lake planning area could cause a reduction in the cost of suppression, increased payroll benefits for non-fire and planned ignition treatments, and more protection in WUI areas. A decreased long-term potential for severe wildland fire would lead to increased firefighter and public safety, and a likely reduction in loss of property (from a large, severe wildland fire event) and suppression expenses.

Impacts from fire or treatment actions would also be beneficial for livestock, resulting in an increase in the quantity and quality of forage. Over time, there would likely be fewer economic losses in the Salt Lake planning area from large, severe wildland fires. The subsequent decrease in fires that would otherwise cross land ownership boundaries onto private and county-owned land would result in an overall increase in safety for the general public.

4.2.13 WILDERNESS CHARACTERISTICS

Short-term Effects on Wilderness Characteristics

Lands with wilderness characteristics are found throughout the planning area and in all suppression categories. 49 percent are found within Category A designated FMUs, seven percent are found within Category B lands, 44 percent are in Category C designated FMUs, and less than one percent are found within Category D designated FMUs. These areas would be managed according to the FMU category in which they are found. Short-term impacts resulting from management response to wildland fire could include ground disturbances associated with suppression and control efforts (e.g. hand lines, vehicle tracks, and spike camps). The short-term impacts from suppression efforts would likely be less than those associated with allowing a fire to burn and potentially impact wilderness characteristics. Short-term and limited impacts for wildland fire suppression could include disturbance to soils, watershed functions, vegetation conditions, and habitats for special status species and fish and wildlife.

To minimize the impairment of wilderness characteristics RPMs have been built into the Proposed Action Alternative to protect the values and the physical resources (e.g., soil, water, special status species, and cultural resources) within these areas. Impacts to these physical resources are discussed in their respective sections.

Those lands with wilderness characteristics located within Category A and B FMUs would likely see more short-term impacts from suppression activities than those found in Category C and D. Impacts would be related to impairment of naturalness and opportunities for solitude and primitive recreation.

ESR activities and seeding would be prioritized within these areas to stabilize wildland fire areas, minimize the threat of invasive and noxious weed establishment, and preserve the natural and unique values inherent to these areas. Short-term and minor impairment of wilderness characteristics could occur due to suppression-related activities.

All planned management activities would undergo a site-specific environmental evaluation to determine potential impacts to wilderness characteristic prior to being approved. Lands with wilderness characteristics do not have special protection. As a result, short-term impacts to naturalness may occur from planned fire activities.

Opportunities for solitude and primitive, unconfined recreation may be restricted (e.g. access and direct use) or impaired (e.g. air quality and visibility) during all of these naturally-ignited and planned fire events. However, these impacts on the quality of visitor experience would be limited to the fire area and duration and likely would not affect overall use and opportunities for these values in other portions of the areas. There may be slightly more impacts in those areas within a suppression category where wildland fire is desired. More acres may be burned within these areas requiring more closures and/or restrictions.

Long-term Effects on Wilderness Characteristics

The Proposed Action Alternative would result in modification of the current condition to a DWFC that would be more historically representative of the natural vegetation cover. A decreased risk of severe wildland fire would be the primary long-term effect associated with wildland fire suppression and the planned actions of prescribed fire and non-fire fuel treatments. The removal of fuels and reduced risk of severe wildland fire would help to preserve and enhance natural conditions opportunities for solitude and primitive recreation, and the array of supplemental values contained within these management areas. Therefore, the Proposed Action Alternative would beneficially affect lands with wilderness characteristics. Natural conditions and the array of supplemental values contained within these management areas would be enhanced and preserved.

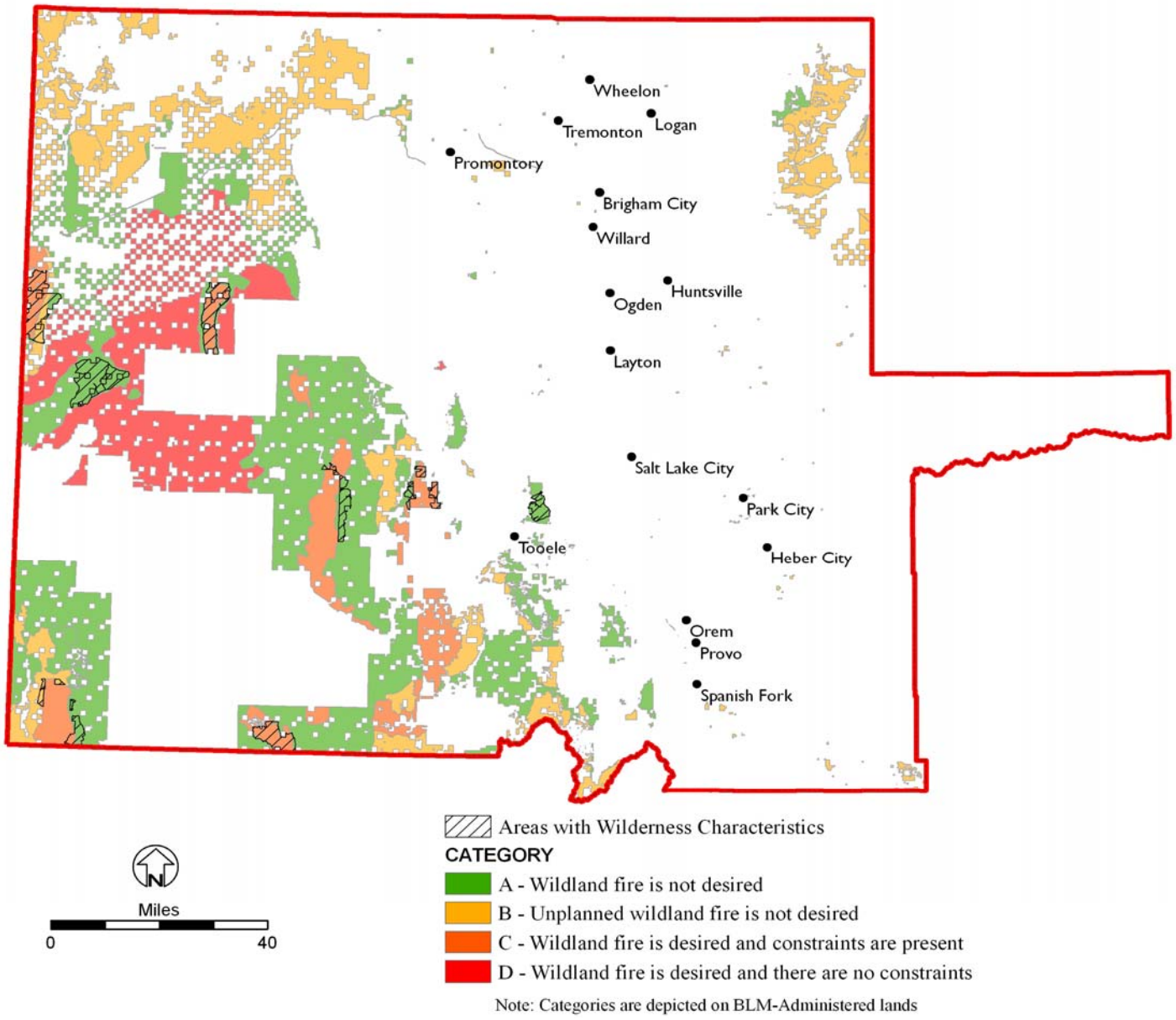
4.2.14 MITIGATION MEASURES

RPMs under the Proposed Action Alternative would minimize or avoid impacts on resources. No mitigation for impacts would be necessary because of the protection already afforded by the RPMs.

4.2.15 RESIDUAL IMPACTS

No mitigation measures are proposed with the Proposed Action Alternative, therefore, no residual impacts from mitigation measures would be present.

FIGURE 4.6: AREAS WITH WILDERNESS CHARACTERISTICS AND FIRE MANAGEMENT CATEGORIES ON BLM-ADMINISTERED LAND



4.2.16 MONITORING AND COMPLIANCE

To ensure an appropriate management response to fire planning needs within the planning area, monitoring measures and compliance with the goals and objectives of this plan would be maintained. This would be achieved through future planning associated with fire management implementation actions. These fire management actions would be evaluated for adherence to the goals and objectives established by this Proposed Action Alternative, as well as specific resource requirements contained within the appropriate Land Use Plan(s). Wildland fire impacts would be compared to FMP goals and, if necessary, revisions to the FMP would be incorporated to reflect the impact of non-planned wildland fire events on the planning area resources. Implementation-level fire management actions would be developed to meet all resource requirements and could include additional monitoring to evaluate and ensure conformance to plan-level decisions. The frequency and duration of monitoring would be determined on a case by case basis.

4.3 NO ACTION ALTERNATIVE

4.3.1 CULTURAL RESOURCES (Including Native American Religious Concerns)

Short-term Effects on Cultural Resources

Under the No Action Alternative, the short-term impacts of from fire management activities would be similar to those described under the Proposed Action Alternative. However, implementation of the No Action Alternative might have a higher potential for heat and duration related impacts for a single wildland fire event (relative to the Proposed Action Alternative), because it does not incorporate RPMs and doesn't focus as strongly on hazardous fuels reduction.

Long-term Effects on Cultural Resources

Under the No Action Alternative, fewer FMUs would be treated to achieve a lower condition class. The long-term trend of moving further from DWFC may result in increased fuel loads that could support higher severity wildland fire events. The long-term impact from on cultural resources would be minor to moderate.

4.3.2 SPECIAL STATUS SPECIES

Short-term Effects on Special Status Species

Under the No Action Alternative, the BLM would continue its current fire management practices. The BLM would still be required to conduct timely or emergency Section 7 consultation with USFWS for all site-specific fire management activities if they would be implemented within suitable or potentially suitable habitat for federally listed species. The Alternative Consultation Agreement to Implement Section 7 Counterpart Regulations could be employed for consultation on projects that support the National Fire Plan.

Because wildland fire suppression under the No Action Alternative would consist of aggressive suppression in most cases, short-term impacts from burning could be less than under the Proposed Action Alternative. However, short-term impacts (e.g., habitat modification, plant mortality, and/or displacement of animal individuals or populations) from actual suppression activities would be greater.

For prescribed fire and non-fire fuel treatments, the No Action Alternative would not incorporate the RPMs. This could lead to slightly more short-term impacts in the No Action Alternative.

Long-term on Special Status Species

Long-term impacts would be similar to the Proposed Action, but the potential for ecosystem-wide beneficial effects would be less since there aren't comprehensive RPM in place. Ecosystem-wide beneficial effects of the Proposed Action Alternative on special status species and their habitat would not be attained under the No Action Alternative. With implementation of aggressive suppression efforts in many cases, fuel loading would continue to increase and the subsequent risk of a severe wildland fire would increase. Indirect, adverse impacts (from long-term fuel loading and changes in vegetation composition and structure caused by aggressive fire suppression and potentially severe wildland fires) to individuals, populations, and habitats would continue.

Although the number of acres allowed for prescribed fire and non-fire fuel treatments would be higher under the No Action Alternative, these actions would not occur on enough acreage to produce the long-term beneficial effects that would occur under the Proposed Action Alternative.

4.3.3 WATER QUALITY

Short-term Effects on Water Quality

Water Quality

Short-term affects to water quality would be similar to those seen under the Proposed Action Alternative.

The use of federally mandated procedures in the vicinity of sensitive areas such as 303(d)-listed impaired waterbodies would likely result in similarly limited impacts on water quality as are anticipated in the Proposed Action Alternative However, the No Action Alternative would provide less guidance and fewer restrictions and RPMs with respect to activities in these areas.

Long-term Effects on Water Quality

Water Quality

Water quality would trend toward greater impacts under this alternative. Under the No Action Alternative, full suppression of wildfires would happen more than in the Proposed Action Alternative. The effort to fully suppress wildfire could lead to an increase in fuel loads. This may result in the increase of uncontrollable high severity fires, which could increase the loss of vegetation cover and organic matter, degradation of sustainable streambanks and widths and more erosion. Effects could also include increases in dissolved and suspended solids, nutrients, and temperature variations outside of normal conditions.

The use of already established BMPs in the vicinity of sensitive areas such as 303(d)-listed impaired waterbodies would likely result in similar limited impacts on water quality as in the Proposed Action Alternative. However, the expected increase in severe and uncontrollable wildland fires would make the ability to follow these guidelines less feasible potentially resulting in a decrease in water quality during and following these events.

4.3.4 WETLAND AND RIPARIAN ZONES

Short-term Effects on Wetlands and Riparian Zones

Short-term effects to surface water would be similar to those expected under the Proposed Action Alternative.

Long-term Effects on Wetlands and Riparian Zones

Long-term impacts on riparian resources would be greater under the No Action Alternative than under the Proposed Action Alternative. Under the No Action Alternative, suppression would remain the principal response to wildland fires. The effort to suppress wildfire could lead to an increase in fuel loads. This may result in the increase of uncontrollable high severity fires, which could increase the loss of vegetation cover and organic matter, amplify the degradation of sustainable streambanks and widths, and increase erosion rates.

The use of prescribed fire and non-fire fuel treatments would be slightly greater under the No Action. Planned fire management and fuels reduction actions would improve riparian resources and reduce erosion potential in the long-term by fostering a healthy, native understory. The No Action Alternative would allow less flexibility in implementing and timing planned management actions that would protect water resources.

4.3.5 WILDERNESS / WILDERNESS STUDY AREAS

Short-term Effects on Wilderness Study Areas

Similar to the Proposed Action Alternative, short-term impacts, though minimized by following management guidelines for WSAs, could still include ground disturbances associated with suppression and control efforts (e.g. hand lines, vehicle tracks, and spike camps). The short-term impacts from suppression efforts could be less than allowing fires to burn and harm the natural, scenic, and biologic values within the WSAs.

Areas have been identified where prescribed fire and non-fire treatment methods would be appropriate, and expected impacts would be similar to planned actions under the Proposed Action Alternative. Mechanical treatments would not be allowed in WSAs or lands where wilderness characteristics would need to be protected. ESR and seeding of these areas would be limited to the use of native plant species to minimize the threat of invasive and noxious weed establishment, reduce erosion, and preserve the natural and unique values inherent to each WSA.

Long-term Effects on Wilderness Study Areas

Under the No Action Alternative, fire management would continue to focus more on suppression efforts while minimizing the impacts of these efforts on and preserving WSA values. The increased emphasis on suppression could lead to more severe long-term impacts than those anticipated by the Proposed Action Alternative.

Areas have been identified where prescribed fire and non-fire treatment methods would be appropriate, and expected impacts would be similar to planned actions under the Proposed Action Alternative. Mechanical treatments would not be allowed in WSAs.

4.3.6 LIVESTOCK GRAZING

Short-term Effects on Livestock Grazing

Under the No Action Alternative, the short-term impacts of fire management activities would be similar to those expected under the Proposed Action Alternative. However, a decrease in the per occurrence acreage goal for wildland fire suppression under the Proposed Action Alternative for many FMUs would decrease the potential for short-term impacts in a single wildland fire event relative to the No Action Alternative. While no annual ceiling for wildland fire suppression is stated in the Proposed Action Alternative, the ten-year suppression goal in the No Action Alternative is similar to the annual suppression goal in the Proposed Action Alternative. This indicates that more impacts are possible under the No Action Alternative due to ground disturbing suppression efforts performed to meet the suppression goal. Because the No Action Alternative would result in fewer total burned acres than would the Proposed Action Alternative, ESR actions would be reduced under this alternative, as would ESR-associated impacts to grazing resources. These relative decreases in impacts would include less impact on allotment use and potentially range improvements. A higher level of planned fuel treatments relative to the Proposed Action Alternative could slightly increase loss of allotment use and forage improvement impacts.

Long- term Effects on Livestock Grazing

Over a ten-year period, less than one-third of the desirable wildland fire would occur, continuing the trend away from DWFC. Fuel loads would continue to increase, which would, in turn, support high-severity wildland fire. This may lead to the loss of allotment use for longer periods than under the Proposed Action Alternative, due to the loss of seed banks and physical and chemical degradation of soil and impairment of a soil's ability to recover after wildfire. The long-term impact from the No Action Alternative would be minor to moderate.

4.3.7 WOODLAND AND FORESTRY

Short-term Effects on Woodland and Forestry

The No Action Alternative would allow the current level of fuel accumulation and juniper encroachment to continue and effects for suppression would be similar to the Proposed Action Alternative. In the short-term, effective prescribed fire treatments would increase the opportunity for the harvesting of biomass and firewood.

Non-fire fuel treatments designed to reduce the occurrence of younger age classes in areas of old growth (in particular for ponderosa, aspen and mixed conifer) could increase the survivability of old growth forests during fire events (Howard 2003). This could increase the availability of higher economic value forest products, particularly in mixed conifer and ponderosa stands. The use of seeding and the planting of seedlings would increase the occurrence of desirable forest types.

Long-term Effects on Woodland and Forestry

Long-term impacts from wildland fire suppression efforts would continue to slightly increase the acres of pinyon and juniper woodland encroaching on land outside of its historic range and acres within its historic range where they have become the dominant species. This would maintain biomass and firewood collection opportunities in this vegetation type. This impact would be comparable in other forest and woodland areas. However, trends away from DWFCs would increase the likelihood of severe wildland fires occurring with an associated loss in harvesting opportunities if these types of fire events became more prevalent.

Prescribed fire and non-fire treatments would initially result in an increase in the opportunity for the harvesting of biomass and firewood. The use of non-fire treatment methods to reduce the occurrence of ladder fuels in areas of desirable old growth forests and woodlands, would also decrease the fire severity and increase the survivability of old growth forests and woodlands during fire events (Howard 2003) in the long-term.

4.3.8 VEGETATION

Short-term Effects on Vegetation

***All Vegetation Types*:** Because wildland fire suppression, prescribed fire, and non-fire fuel treatments would all be used as fire management tools under the No Action Alternative, short-term impacts from each of these actions would be similar to those described under the Proposed Action Alternative.

Salt Desert Shrub: Because of the similarity between the Proposed Action Alternative and the No Action Alternative, the effects to this vegetation type would be the same as described under the Proposed Action Alternative, with the exception of the RPMs. Effects would be the same for prescribed fire and non-fire fuel treatments. During wildfire suppression, the No Action Alternative does not contain the RPMs established for invasive species and noxious weeds in the Proposed Action Alternative, but these measures would be considered part of the No Action Alternative due to EO 13112 (Invasive Species) and the effects would be the same as the Proposed Action Alternative. Because noxious weed and cheatgrass invasion are the main reasons that the vegetation type is in condition class 2 or condition class 3, ESR should improve the conditions and possibly reduce the condition class.

Sagebrush: For wildfire suppression, the No Action Alternative does not contain the RPMs established for invasive species and noxious weeds in the Proposed Action Alternative, but these measures would be considered part of the No Action Alternative due to EO 13112 (Invasive Species) and the effects would be the same as the Proposed Action Alternative. Because noxious weed and cheatgrass invasion are the main reasons that the vegetation type is nearly all in condition class 3, ESR should improve the conditions and possibly reduce the condition class. The effects of prescribed fire and non-fire fuel treatments would be the same as described under the Proposed Action Alternative.

Pinyon and Juniper Woodlands: Fire suppression has the potential to disturb this vegetation type due to fireline construction or other initial attack actions, in addition to the impacts from the fire itself. Provided that ESR is applied as anticipated in Chapter 2, cheatgrass and noxious weed invasion would be reduced.

Prescribed fire would reduce acres of juniper encroachment and reduce the density of pinyon and juniper woodlands. Prescribed fire would probably be lethal to many small or young juniper trees.

Non-fire fuels treatments would reduce densities of juniper and pinyon, and consequently fuel loads as well as reduce invasion of cheatgrass.

Mountain Shrub: Fire suppression has the potential to disturb this vegetation type due to fireline construction or other initial attack actions, in addition to the impacts from the fire itself. These types are at high risk of cheatgrass invasion following fire. ESR would reduce the risk of cheatgrass invasion following fire. Mountain shrub can resprout or reseed following fire, and effects of fire on the vegetation type would be a reduction of available fuels.

Effects from prescribed fire would be much the same as wildland fire suppression. RPMs to reduce invasive species would reduce the risk of cheatgrass invasions. Most species in this vegetation type can resprout or reseed following fire, and effects of fire on the vegetation type would be a reduction of available fuels.

Non-fire fuels treatments would reduce fuel loadings in this vegetation type, and reduce the risk of cheatgrass invasion.

Mixed Conifer: Fire suppression has the potential to disturb this vegetation type due to fireline construction or other initial attack actions, in addition to the impacts from the fire itself. Mixed conifers frequently benefit from fire, include a reduction in fuel loadings and density. These effects increase the nutrients and water available to remaining plants and reduce the severity of future fires.

Prescribed fire would be very effective at reducing fuel loadings and densities on mixed conifer sites, although these treatments are reduced compared to the Proposed Action Alternative. Effects from prescribed fire would be much the same as wildland fire suppression.

Non-fire fuels treatments would reduce fuel loadings in this vegetation type, and reduce the risk of noxious weed and cheatgrass invasion.

Long-term Effects on Vegetation

The long-term effects of the No Action Alternative for all vegetation types would be the same as the Proposed Action Alternative for suppression and fuel treatments.

4.3.9 FISH AND WILDLIFE

Short-term Effects on Fish and Wildlife

Because wildland fire suppression under the No Action Alternative would consist of aggressive suppression in most cases, short-term impacts from burning could be less than under the Proposed Action Alternative where some acres would be considered appropriate for less aggressive suppression activities. However, short-term impacts (e.g., introduction of fire retardant and/or foam into the ecosystem, habitat modification, plant mortality, and/or displacement of animal individuals or populations) from actual suppression activities would be greater.

Because the number of acres allowed for prescribed fire would be higher under the No Action Alternative, short-term impacts would be similar to those listed for the Proposed Action Alternative, but to a greater degree. A higher number of adverse impacts on fish and wildlife species and their habitat could occur.

Under the No Action Alternative, a slightly higher number of acres would be allowed for non-fire fuel treatments. Therefore, short-term impacts associated with ground disturbance and potential for noxious weed infestation (i.e., alteration of habitat, particularly foraging habitat) would be greater than under the Proposed Action Alternative.

Fish

Direct effects could occur from wildland fire suppression, including the introduction of fire retardant, aviation fuel, or lubricants into streams and wetlands; erosion of exposed soils from fireline construction on steep slopes adjacent to streams; damaged riparian vegetation and soils (resulting in erosion) from the use of heavy equipment and establishment of fire camps; and reduced natural stream flow during drafting and pumping. If these impacts occurred, they would adversely impact water quality of the various fisheries throughout the Salt Lake FMP planning area. The collective short-term impacts of increased sedimentation (from erosion) could have watershed-wide effects including changes in temperature, turbidity, and water chemistry.

Because protective measures would ensure limited acres of prescribed fire and impose constraints on non-fire fuel treatments in and adjacent to riparian and wetland and water habitats, short-term adverse impacts from these fire management activities would be minimized or eliminated.

Non-game and Big Game Species

Direct effects from wildland fire suppression could include damaged vegetation (including forage resources) from the use of heavy equipment and establishment of fire camps, weed invasion, and increased size of an undesirable habitat type. Direct effects from prescribed fire and non-fire fuel treatments could include mortality to individual animals, modification or destruction of forage or prey resources, habitat alteration or damage, and species displacement.

In addition to direct impacts, indirect impacts could include changes in the survival or successful reproduction of aquatic prey species due to increased sedimentation and subsequent habitat modification as a result of upstream erosion, as well as damage to forage resources including inhibited leaf production, decreased understory diversity and overall species richness, increased insect herbivory, and suppressed flowering from the introduction of fire retardant or foam (Adams and Simmons 1999).

Long-term Effects on Fish and Wildlife

More extensive use of wildland fire suppression activities and a lack of applicable and up-to-date RPMs would increase the potential for noxious weed establishment over time, thereby modifying wildlife habitat (particularly habitat that would otherwise provide forage resources). Additionally, by suppressing wildland fires at current levels in the planning area, and using prescribed fire and non-fire fuel treatments to reduce fuel loading in only a small portions of the planning area, a greater risk of severe wildland fire would result. Adverse impacts (from long-term changes in vegetation composition and structure caused by aggressive fire suppression and potentially severe wildland fires) on individuals, populations, and habitats would continue.

Fish

Long-term adverse impacts on fisheries and aquatic resources could include alteration of habitat quality from repeated short-term impacts, an increased risk of severe wildland fire and, subsequently, additional adverse impacts.

Non-game and Big Game Species

The long-term effects of the No Action Alternative on fish and wildlife species found within the Salt Lake planning area would be similar to the long-term effects described for special status animal species.

Because wildland fire acres would be less under the No Action Alternative, and prescribed fire and non-fire fuel treatments would not change, the overall condition of the landscape would continue to trend away from its natural fire regime and the build up of hazardous fuels would continue. Forage opportunities may be impacted in larger areas for longer periods of time.

4.3.10 SOILS

Short-term Effects on Soils

Effects on soil quality and health resulting from fire management actions are generally not addressed in most resource and FMPs currently in use. Therefore, the No Action Alternative would provide minimal guidance for most of the planning area with respect to soil erosion as it relates to fire actions. Short-term affects to

soils would be similar to those seen under the Proposed Action Alternative. However, under the No Action Alternative, there would potentially be fewer acres directly affected by wildland fire and slightly more acres affected by prescribed fire.

Due to the lack of RPMs under the No Action Alternative, soils would be at greater risk to impacts due to soil disturbance and compaction related to intensive fire suppression activities such as fireline construction, road construction and other uses of heavy equipment. Slightly more non-fire fuel treatments and prescribed burns would occur under this alternative with associated ground and vegetation disturbance and soil compaction resulting from these actions.

Similar to the Proposed Action Alternative, potential indirect impacts of the No Action Alternative include potential sedimentation of streams and reservoirs from wind and water erosion and fugitive dust from wind erosion.

Long-term Effects on Soils

Fuels treatment goals would be similar to the Proposed Action Alternative, but because suppression activities would be greater in the No Action Alternative, wildland fires under the No Action Alternative could increase in size and severity, resulting in a greater occurrence of negative impacts to soil resources. High severity fires would remove more of the vegetation cover and organic matter, reducing nutrient cycling. Increases in physiochemical alteration (such as increased salinity) and decreases in plant-available moisture in shallow soils could occur. High severity wildfires are also more likely to adversely affect soil microorganisms, decreasing biological crusts that prevent erosion and fix nitrogen from the atmosphere. High severity fires may also result in the formation of water-repellent soil layers (Robichaud et al. 2000), which can decrease infiltration and increase the rate and quantity of runoff causing accelerated erosion and potentially dangerous debris flows. The degree of water repellency in soils following a fire is positively correlated with fire severity. These impacts would decrease the ability for soil to foster the beneficial uses of natural vegetative growth and wildlife habitat.

4.3.11 RECREATION

Short-term Effects on Recreation

The impact to recreational sites and facilities from wildland fire suppression under the No Action Alternative would be slightly higher than those in the Proposed Action Alternative. The management goal of suppression of wildfire would increase the preservation of recreation infrastructure. Using prescribed fire and non-fire fuel treatments, particularly surrounding sites and facilities, would have a similar effect on hazardous fuel loads compared to the Proposed Action Alternative.

Long-term Effects on Recreation

Under the No Action Alternative, the emphasis on suppression would aim to protect developed sites, facilities, and the surrounding area. The lower levels of planned fire and non-fire fuel treatments, relative to the Proposed Action Alternative, would continue the current trend of increasing hazardous fuel loads. In addition, many of the developed sites and facilities have the potential to have numerous ignition sources (campfires, improper disposal of cigarettes, vehicle exhaust systems, fireworks, and others) creating a situation where potential for impacts to infrastructure and recreationists safety would increase with time.

4.3.12 SOCIOECONOMICS

Short-term Effects on Socioeconomics

The short-term effects of the No Action Alternative on the Salt Lake planning area could include a greater risk to WUI areas (and their associated infrastructure and resource values), reduction in air quality, and temporary loss of allotment use.

Long-term Effects on Socioeconomics

Continuing fire suppression in most areas could cause an increase in payroll benefits for suppression forces, particularly in the long-term with the increased potential for severe wildfire. Because wildland fire suppression would be used more, and prescribed fire and non-fire fuel treatments would be used about the same as the Proposed Action Alternative, under the No Action Alternative, a slight trend toward larger fuel build-up would continue, and a subsequent risk of severe wildland fire would increase over the long-term. Impacts to socioeconomic resources associated with severe wildland fire would include a greater risk to WUI areas (same as in the short-term). Greater economic impacts to other land users would occur.

4.3.13 WILDERNESS CHARACTERISTICS

Short-term Effects on Wilderness Characteristics

Under the No Action Alternative, fire management would continue to focus more on suppression. The increased emphasis on suppression could lead to more severe short-term impacts than those anticipated by the Proposed Action Alternative. Expected impacts from the No Action would be similar to the Proposed Action Alternative for prescribed fire, non-fire fuel treatments, and ESR.

Long-term Effects on Wilderness Characteristics

The No Action Alternative would result in the continuation of the current management direction to suppress fires in these areas. Not allowing wildfires to burn in these areas would allow hazardous fuels to collect, and continue the trend toward larger and more severe fires. Because a continuation of the current undesired fire regime and vegetation condition would be accommodated by this alternative, a long-term adverse impact to naturalness and supporting supplemental values associated with wilderness character lands would likely result. Subsequent opportunity values for solitude and primitive and unconfined recreation may be impaired as well.

4.4 CUMULATIVE EFFECTS

4.4.1 REASONABLY FORESEEABLE ACTION SCENARIO

The following reasonably foreseeable action scenario (RFAS) identifies actions that would affect the same resources in the cumulative impact area as the Proposed Action Alternative and alternatives.

- National fire plan activities for all surrounding federal and many state land management agencies
- Land and resource management planning throughout Utah
- Continuing implementation of the Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah

- Continuing implementation of Recreation Guidelines
- Continuing implementation of the vegetation treatment on BLM lands in 13 Western states (BLM 1991) and upcoming vegetation EIS
- Regulatory actions, guidance, and associated revisions for sagebrush restoration and multiple use on public lands
- Vegetation treatment resulting from wildlife mitigation projects (big game winter range, sage grouse habitat restoration)
- TMDL planning
- Air quality degradation or improvement
- Continued increase in WUI
- Increase in recreational use of BLM lands

4.4.2 CULTURAL RESOURCES

Proposed Action Alternative's Effect on Cultural Resources

Increased population and associated developments in the WUI and adjacent to BLM-administered lands may result in impacts to cultural resources. These would include an associated increase in vandalism, artifact collection, and destruction.

The Proposed Action Alternative would reduce impacts to cultural resources in the long-term. However, in the short-term more artifacts may be revealed. Cumulative effects activities would add to the disturbance, possible destruction, or removal of cultural artifacts. Existing regulations and protocols should help reduce the impacts on cultural resources.

No Action Alternative's Effect on Cultural Resources

Cumulative effects are the same for the No Action Alternative (i.e. population expansion in WUI areas and associated developments).

4.4.3 SPECIAL STATUS SPECIES

Proposed Action Alternative's Effect on Special Status Species

Special status species could be subject to temporary displacement and habitat alterations from reasonably foreseeable actions, but management actions would be planned to avoid and minimize the impacts on special status species and their habitat. Noxious weeds could negatively affect the habitat of some species.

Short-term adverse impacts would be offset by long-term beneficial effects of rehabilitation activities (large scale implementation of the National Fire Plan, the Vegetation EIS, and Rangeland Health Standards and Guides), protected ecological resources (remaining after a suppression event), and reduction of the fuel load (following a prescribed fire or implementation of a non-fire fuel treatments). The subsequent, gradual return to a more natural fire regime would result in long-term beneficial effects. Hazardous fuels would be reduced, which would reduce the risk of large, severe fire events, including the risk of habitat alteration.

No Action Alternative's Effect on Special Status Species

Impacts from reasonably foreseeable actions would be similar to those described under the Proposed Action Alternative. Additionally, although short-term adverse impacts would be minimized under the No Action Alternative, the long-term risk of severe wildfire (and associated risk to special status plants and animals and their habitat) would continue on the BLM-administered lands. Disturbance and habitat quality impacts from reasonably foreseeable actions would contribute to negative impacts on special status species.

4.4.4 WATER QUALITY

Proposed Action Alternative's Effect on Water Quality

The cumulative effect of the Proposed Action Alternative on water quality would translate into an improvement in watershed health, a more sustainable supply of woody debris or streambank vegetation, and overall streambank and channel stability. Cumulative effects from recreational use and noxious weeds would continue to have negative sediment load effects. The implementation of guidance on grazing, water quality (TMDLs), and OHV use would improve the water quality and supply when combined with the long-term effects of the Proposed Action Alternative.

No Action Alternative's Effect on Water Quality

Cumulative effects of the No Action Alternative would generally have negative effects on water quality, largely from increasingly severe wildfires. Increased or reduced infiltration capacity would affect groundwater resources. Large-scale implementation of the National Fire Plan, by other agencies and improvements made when regulations decrease impacts would have the same positive benefits as described under the Proposed Action Alternative. Effects from other reasonably foreseeable actions (such as grazing, OHV use, and property development) could exacerbate these problems. Overall, the long-term trend would be toward a degradation of water quality and increased alteration of natural hydrologic systems.

4.4.5 WETLANDS AND RIPARIAN ZONES

Past management and environmental actions, including changes to vegetation conditions and the resulting modification of fire role and regime, have resulted in an existing environment much different than the historical condition. Alterations including diversion, impoundment, channelization, dewatering, timber and grazing practices, and the invasion of nonnative and noxious vegetation species have altered riparian conditions and created non-functioning or limitedly functioning riparian areas.

Proposed Action Alternative's Effect on Wetlands and Riparian Zones

Overall, the cumulative effect on riparian resources would be an increase in soil stability, a more sustainable supply of woody debris and streambank vegetation, overall improvement in native vegetation composition, overall improvement in bank and channel stability, and increased functionality of riparian areas. Cumulative effects from recreational use could continue to have negative sediment load effects and noxious weeds could continue to proliferate. However, the implementation of management guidance on grazing, recreation and OHV use, and vegetation treatments would improve the overall health and quality of riparian areas when combined with the long-term effects of the Proposed Action Alternative.

No Action Alternative's Effect on Wetlands and Riparian Zones

Cumulative effects of the No Action Alternative would generally be similar to the Proposed Action Alternative, but with a somewhat greater potential for negative effects on riparian areas due to the lack of stated RPMs and the possibility of increasingly severe wildfires. Current management direction dictates that riparian and wetland areas would be enhanced whenever possible, with the overall goal of restoring riparian and wetland areas to proper functioning condition and ensuring long-term quality habitat (BLM 1998b). Recreation and grazing practices could potentially cause increased erosion and damage to vegetation. Noxious weeds could continue to proliferate. However, management policies and practices would attempt to minimize these effects.

4.4.6 WILDERNESS STUDY AREAS

Proposed Action Alternative's Effect on Wilderness Study Areas

Past management and environmental actions, including changes to vegetation conditions and the resulting modification of fire role and regime, have resulted in an existing environment much different than the historical condition. Likewise, a variety of political and regulatory management constraints associated other resource needs and safety considerations affect how the role of fire or non-fire fuels management can be applied within these areas.

Reasonably foreseeable increases in recreational use, growth and development, and implementation of the National Fire Plan would reduce opportunities for solitude and primitive recreation. Naturalness would be enhanced in the long-term as fire is allowed to play is natural role on more landscapes.

Increased recreational use could likely reduce opportunities for solitude and primitive recreation. Continued increases in the human population and WUI would likely influence the selection of treatment methods in the long-term, which would affect the ability of fire to play its natural role.

No Action Alternative's Effect on Wilderness Study Areas

Large scale implementation of the National Fire Plan and the BLM's Vegetation EIS would increase naturalness in the long-term. Increased recreational use may reduce opportunities for solitude and primitive recreation.

4.4.7 LIVESTOCK GRAZING

Proposed Action Alternative's Effect on Livestock Grazing

Cumulatively, additional regulatory direction related to the Proposed Revision to the Grazing Regulations on Public Lands would eventually lead to increased rangeland health and improved management. Increased recreational use and continued spread of noxious weeds could have a negative impact on grazing resources.

Changes in grazing regulations, combined with the effects of the Proposed Action Alternative, would contribute to the long-term increased productivity and stability of grazing resources.

The negative effects of noxious weed infestation could be lessened by portions of the Proposed Action Alternative; ESR would contribute to the overall improvement of health of grazing resources by making it more resistant to noxious weed infestation.

No Action Alternative's Effect on Livestock Grazing

The effects of the No Action Alternative on livestock grazing include an increase in the fuel load (consisting specifically of unpalatable vegetation species), a continued increase in the likelihood of severe wildland fires on many allotments over the long-term, and a consequent increase in post-fire recovery time. Regulations on grazing would eventually lead to increased rangeland health and better management. However, increased fuel loadings under the No Action Alternative would reduce stability of grazing resources, due to increases in noxious weeds. Negative impacts from the spread of noxious weeds on lands adjoining the Salt Lake planning area combined with the added risk of severe wildfires would reduce the health and productivity of livestock grazing resources. This would be most pronounced in the west desert portion of the planning area, where cheatgrass infestation is of great concern.

4.4.8 WOODLAND AND FORESTRY

Proposed Action Alternative's Effect on Woodland and Forestry

National Fire Plan activities, FMP revision, implementation of Standards for Rangeland Health and Guides, and continuing implementation of the Vegetation Treatment on BLM lands in Thirteen Western States would all contribute to a reduced condition class, which would help protect old growth. These activities would not have any cumulative effects on commercial uses of BLM managed forest.

Increases in WUI, development, and recreational activities may eventually put more demands on local sources of biomass, timber, firewood, and pinyon nuts.

No Action Alternative's Effect on Woodland and Forestry

Cumulative effects under the No Action Alternative would be the same as under the Proposed Action Alternative.

4.4.9 VEGETATION

Proposed Action Alternative's Cumulative Effects

National Fire Plan activities, FMP revision, implementation of Utah Standards for Rangeland Health and Guides for Grazing Management, and continuing implementation of the Vegetation Treatment on BLM lands in Thirteen Western States would all contribute to a reduction in invasive species and fuel loads where treatments are applied.

Increases in WUI, development, and recreational activities may eventually cause more acres to have wildfire suppression actions due to the AMR.

No Action Alternative's Cumulative Effects

Cumulative effects of the No Action Alternative would be the same as the Proposed Action Alternative.

4.4.10 FISH AND WILDLIFE

Proposed Action Alternative's Effect on Fish and Wildlife

Reasonably foreseeable actions would subject wildlife & fisheries to temporary displacement and habitat alterations. Overall fuel reductions associated with the large-scale implementation of the National Fire Plan on adjacent lands would gradually reduce the risk of a severe wildland fire event, and restore ecosystems that would reflect vegetation composition more consistent with natural fire regimes.

Because planned actions described within the Proposed Action Alternative would be timed to avoid and minimize impacts on critical habitat and breeding seasons, short- and long-term impacts of the Proposed Action Alternative would contribute little to reasonably foreseeable actions.

No Action Alternative's Effect on Fish and Wildlife

Overall fuel reductions associated with the large-scale implementation of the National Fire Plan would gradually reduce the risk of a severe wildland fire event, and restore ecosystems that would reflect vegetation composition more consistent with natural fire regimes.

The No Action Alternative could contribute to long-term adverse impacts (from changes in vegetation composition and structure caused by aggressive fire suppression and potentially severe wildland fires) on individuals, populations, and habitats.

4.4.11 SOILS

Proposed Action Alternative's Effect on Soils

Effects of the Proposed Action Alternative (long-term reduction in soil loss, erosion, compaction, and damage to the soil crust and less risk of altered porosity and infiltration rates) would be added to the effects from reasonably foreseeable actions such as increased recreational land use and noxious weeds, but the Proposed Action Alternative would help to minimize the total negative effects. The implementation of any forthcoming, soil-protecting guidance on water quality (TMDLs), OHV use in LUPs, and implementation of the National Fire Plan on a large scale, would improve the soil attributes when combined with the long-term effects of the Proposed Action Alternative.

No Action Alternative's Effect on Soils

Under the No Action Alternative, there would be an increasing risk over time of loss of vegetation cover and organic matter and an increase in erosion, along with a reduction in microorganisms and infiltration on BLM-administered lands, which would be minimally offset by implementation of the National Fire Plan by other agencies. Cumulative effects from reasonably foreseeable actions (described above) would exacerbate these problems with the exception of the improvements made when regulations decrease impacts. Overall, the long-term trend would be toward a more negative condition for soil on BLM lands.

4.4.12 RECREATION

Proposed Action Alternative's Effect on Recreation

Recreation may be affected from reasonably foreseeable actions. Increased recreational use and facility development, ongoing growth and development, wildfire, increase in the WUI and noxious weeds would all change visitors' experiences.

Cumulatively, these effects, along with the Proposed Action Alternative, may increase the susceptibility of recreational facilities, dispersed camping areas, trails, OHV routes and sanitation facilities to fire or fire suppression impacts. Increases or reprioritization of fuel treatment projects may be required to protect recreational resources. Long-term benefits include reduced fuel loadings leading to more effective protection against wildfire and improved safety of recreationists.

The expected increase in recreation facilities would put a demand on fuel treatment funds. The opportunity to use these limited funds to do fuel treatments surrounding the recreation sites and facilities may be even more limited due to competition for funding with WUI areas. This could create greater impacts to recreation sites and facilities and to WUI areas trying to share funding.

No Action Alternative's Effect on Recreation

The impact of agency priorities for funding of the creation of developed recreation sites and the maintenance of existing sites may have the greatest impact on visitor day availability of developed sites and facilities.

The expected increase in WUI areas would put a demand on fuel treatment funds. The opportunity to use these limited funds to do fuel treatments surrounding the recreation sites and facilities may be even more limited. This could create greater impacts to recreation sites and facilities and to WUI areas trying to share funding. Noxious weed spread would be exacerbated by the No Action, which could eventually lead to reduced recreational enjoyment.

4.4.13 SOCIOECONOMICS

Proposed Action Alternative's Effect on Socioeconomics

Cumulatively, a continued increase in WUI areas, recreational use of BLM-administered lands, and growth and development throughout the planning area would put more pressure on the BLM to protect resources from wildland fire both inside and outside of WUI area. An increase in public use would expose a greater number of people to impacts from fire management actions on BLM-administered lands and areas adjacent to them. The cumulative effects of the Proposed Action Alternative and reasonably foreseeable development scenario could result in additional payroll for planned management actions and its corresponding increase in agency expenses. Additional public response to the Proposed Action Alternative could cause alterations in proposed treatments and expansion of WUI areas.

Reasonably foreseeable actions together with the Proposed Action Alternative could cause a short-term displacement of effected populations from smoke and dust. People could be forced to leave their residences during wildland fire events and suppression activities. Some businesses could be forced to close during fire management activities, resulting in a loss of income for the duration of the activity.

No Action Alternative's Effect on Socioeconomics

Cumulatively, continued increase in WUI area, recreational use of BLM-administered lands, and growth and development throughout the planning area would potentially expose more of the public to severe wildland fire, and could increase the value of resources damaged by them. Aggressive wildland fire suppression (without sufficient planned fuel treatments to lessen fuel loads in, and adjacent to, developed areas), would increase the risk for severe wildland fire in the WUI.

4.4.14 WILDERNESS CHARACTERISTICS

Proposed Action Alternative's Effect on Wilderness Characteristics

Past management and natural changes, including vegetation conditions and the resulting modification of fire role and regime, have resulted in an existing environment much different than the historical condition (see Purpose and Need, Chapter 1).

Reasonably foreseeable increases in recreational use, growth and development, and implementation of the National Fire Plan would reduce opportunities for solitude and primitive recreation. Naturalness would be enhanced in the long-term as fire is allowed to play is natural role on more landscapes. This would omit the presence of large fire crews and other related intrusions.

Increased recreational use could likely reduce opportunities for solitude and primitive recreation offsetting that caused by the Proposed Action Alternative. Continued increases in the WUI and more people in general would likely influence the treatment methods in the long-term, which would affect the ability of fire to play its natural role.

No Action Alternative's Effect on Wilderness Characteristics

In addition to changes in wilderness characteristics from past management and natural events, large scale implementation of the National Fire Plan and the Vegetation EIS would increase naturalness in the long-term, but the No Action Alternative would limit this increase to non-BLM lands. Increased recreational use may likely reduce opportunities for solitude and primitive recreation in addition to that caused by the No Action.

CHAPTER 5. CONSULTATION AND COORDINATION

5.1 INTRODUCTION

Issues identified for analysis within this EA are included in **Appendix A**. They include resource concerns, including those for resources considered as Critical Elements of the Human Environment, and related issues derived from the BLM, affiliated agency reviews, and comments received. A thorough consultation and coordination effort among agencies and public parties with interests in the process was planned and conducted to ensure the opportunity for involvement throughout the EA process.

5.2 PERSONS, GROUPS, AND AGENCIES CONSULTED

The BLM coordinated and collaborated with numerous federal, state, tribal, and local government agency representatives as well as private organizations and individuals wishing to participate in the LUP amendment and FMP revision processes. The BLM contacted more than 60 federal representatives; 40 state agency representatives (Utah and neighboring states of Arizona, Nevada, and Colorado); 100 county and city governments across Utah; and more than 70 tribes and tribal representatives. Each contact received public scoping meeting notices and planning bulletins informing them of the purpose, schedule, and progress of the project. The mailing list is contained in the Administrative Record within the project documentation. **Table 5.1** lists some of the persons, agencies, and organizations consulted for purposes of the FMP EA.

TABLE 5.1: LIST OF PERSONS, AGENCIES, AND ORGANIZATIONS CONSULTED

Name	Purpose and Authorities for Consultation or Coordination	Findings and Conclusions
U.S. Environmental Protection Agency (EPA), Region 8	Consultation for responsibilities under National Environmental Policy Act (NEPA) and Section 309 of the Clean Water Act	The EPA provided formal comments to the BLM during public scoping on May 17, 2004 and identified concerns that included the need to develop broad fire planning to protect local ecology, recreation, and commodity production. The EPA requested that BLM consider management needs for local fuel hazards; that fire management planning would conform to interim air quality policy and local smoke management plans; and that management be developed to protect aquatic resources from adverse impacts on soil and water. The EPA also identified analysis considerations associated with livestock grazing and noxious weed control. The BLM considered EPA's comments and incorporated them into the Proposed Action Alternative and the analysis of the alternatives.
U.S. Fish and Wildlife Service (USFWS)	Consultation under Section 7 of the Endangered Species Act (ESA) (16 USC 1531) and Biological Assessment (BA) Review	USFWS is a participating party who is consulting under an agreement that tiers off the BLM and USFWS November 1, 2001 consultation agreement and March 3, 2004 alternative consultation agreement for land use planning. USFWS has provided comment and analysis recommendations for the species list prepared by the BLM. USFWS has also reviewed, provided additional RPMs, and concurred with the species findings within the BA, completed on March 4, 2005.
Tribes and Tribal Representatives within Utah and Surrounding States	Consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1996) and National Historic Preservation Act (NHPA) (16 USC 470)	Planning bulletins were provided to approximately 50 tribes by BLM on June 21, 2004. In addition, individual letters were sent to each tribal government on June 29, 2004 regarding BLM's intent to conduct this EA and requesting their participation and cooperation. Tribes were also invited to public scoping meetings that took place from July 6-14, 2004. To date, no tribal government has agreed to participate or formally consult on this project.

Name	Purpose and Authorities for Consultation or Coordination	Findings and Conclusions
Utah Governor's Office of Planning and Budget—Resource Development Coordinating Committee (RDCC)	Consultation regarding on-going multi-agency planning actions and associated federal planning actions	BLM and Maxim Technologies (Maxim) met with the RDCC on June 23, 2004 to discuss the scope of proposed fire management planning and to seek input from associated state agencies that may be affected by the proposed federal actions. Utah Division of Wildlife Resources (UDWR) and Utah Division of Forestry, Fire, and State Lands (FFSL) indicated their desire to be involved in federal fire planning discussions (see proceeding comments). RDCC also responded to the BLM with a formal letter on July 15, 2004, which outlined the UDWR's considerations.
Utah Department of Community and Economic Development—Utah State Historic Preservation Office (SHPO)	Consultation on proposed fire management as required by the NHPA (16 USC 470)	BLM and Maxim staff met with SHPO (in June 2004 and July 2004) to discuss scope of planning and the possibility of SHPO acting as a participating party in the FMP process. SHPO had determined at these meetings not to act as a participating party, but they did provide feedback on the scope and analysis of the Proposed Action Alternative.
Utah Division of Natural Resources—Division of Forestry, Fire and State Lands (FFSL)	Consultation on fire management planning on adjacent state lands	FFSL attended the BLM statewide interdisciplinary team (IDT) meeting on June 22, 2004 and June 23, 2004, and contributed to scope and analysis discussions. BLM met with FFSL on August 24, 2004 to discuss the proposed direction of statewide fire management on public lands, as well as the need to coordinate with local BLM field offices in the development of fire management planning. Maxim staff coordinated with FFSL staff in September and October 2004 to obtain resource data and historic wildland fire information to support BLM data and the development of the EA.
Utah Division of Natural Resources—Division of Wildlife Resources (UDWR)	Consultation on impacts of fire management on fish and wildlife species	The UDWR, in association with the Governor's Office of Planning and Budget, and RDCC, provided formal comments to the BLM on July 15, 2004, and requested to be included as a participating party. The BLM coordinated proposed fire management actions with UDWR. Maxim staff coordinated with a variety of UDWR personnel, from July through October 2004, in developing fish and wildlife resource data, GIS data, and scope of analysis within the EA. These meetings also included coordination with the UDWR Utah Natural Heritage Program.
Summit County Fire Chief (SCFC)	Informal discussion with the county fire chief about county lands issues	On July 14, 2004, SCFC discussed lands and realty issues with the BLM in regard to actions within the Salt Lake Field Office. The BLM provided the SCFC with explanations and maps associated with the Iso-Tract planning area and how lands are exchanged.

5.3 SUMMARY OF PUBLIC PARTICIPATION

During initiation of the EA preparation process the public was notified of the Proposed Action Alternative. A Notice of Intent (NOI) invited participation of interested agencies, organizations, and members of the general public to assist the BLM in determining the scope of issues to be addressed. It was published in the Federal Register on April 2, 2004. The publication of this NOI initiated a public scoping comment period that ended on July 21, 2004.

A Public Involvement Plan was prepared in June 2004 to ensure an effective, consistent, and open communication process among BLM and other federal, state, and local government agencies; Native American tribes; the public; and other stakeholders. This plan not only outlined the series of open house public meetings throughout the state that would allow for comment and discussion on current and proposed fire management, but also planned for continued public involvement opportunities throughout the project.

A Planning Bulletin was developed to advise the public of the fire management project. It also described the project, encouraged public participation at public scoping meetings, and identified opportunities and methods for submitting comments throughout the NEPA process. In addition to providing background information, the Planning Bulletin outlined the public involvement process for the project including; the schedule; a listing of public meetings; instructions on making comments and joining the mailing list; information about the project's public website; and contact information. On June 24, 2004, the Bulletin was sent to 1,149 individuals, organizations, state, county and city government agencies, and tribal governments and groups on the BLM's mailing list. The BLM sent each tribal government an individualized letter (dated June 29, 2004) inviting them to consult on the project.

5.3.1 PUBLIC MEETINGS

On June 25, 2004, a public notice was delivered as a media advisory and press release to Utah newspapers, radio stations, and one cable television station. The notice announced public scoping meeting dates, times, and locations, and invited the public to participate. Prior to the formal scoping process, the BLM provided a number of opportunities for federal, state, and local agencies, interested organizations, and the general public to provide input for the planning process. These opportunities included early notification of the scoping process, a lengthy comment period, public meetings, and newspaper reminders of meeting times and locations. Comments were received from April 2, 2004 through July 21, 2004.

From July 6, 2004 through July 14, 2004, BLM conducted five open house meetings in Moab, Cedar City, Richfield, Vernal, and Salt Lake City, Utah. These meetings were announced in a Planning Bulletin that was mailed on June 24, 2004, to more than 1,100 individuals and organizations throughout the state and through news releases. Further, the Utah BLM webpage advertised the meetings and scoping period. Approximately 700 subscribers of the Utah BLM electronic newsletter ("E-Briefs") received related information. A series of Public Scoping Meetings were held across the state according to the schedule in **Table 5.2**.

TABLE 5.2: PUBLIC SCOPING MEETINGS

Date	City	Facility
July 6, 2004	Moab	BLM Field Office
July 7, 2004	Cedar City	Heritage Center, Festival Hall 1
July 8, 2004	Richfield	BLM Field Office
July13, 2004	Vernal	Western Park
July 14, 2004	Salt Lake City	BLM Field Office

An open house format was used for the scoping meetings, in which attendees could interact informally and individually with BLM representatives. Attendees signed a registration sheet and received an information packet with handouts including a comment form, state map depicting the planning areas, the NOI, and a list of project-related web resources.

5.3.2 PUBLIC COMMENTS

During the public scoping period, comment letters were received from the Resource Development Coordinating Committee (RDCC) and from UDWR in conjunction with RDCC. In addition, work was performed among the BLM, The Wilderness Society, and other environmental groups to address concerns raised following their review of a preliminary draft of the Proposed Action Alternative.

Other responses to solicitations for public input resulted in letters that were received via fax, mail, email, and hand. A total of 20 letters were received with 91 individual comments identified. Each letter was source coded based on its origin (type) and numerical sequencing. Written letters were source coded based on the commenter as either "A" for agency/government, "I" for individual, or "O" for organization. The second digit of the source code assigned relates to the number of letters in each group (e.g., O6 refers to the sixth letter received from an organization). A comment summary table was developed that grouped comments by topic. Each comment was assigned a two-digit topic code.

A complete analysis of the comments, list of commenters, and response to public comment will be included as a part of this EA document once the public comment and review period is concluded.

5.4 LIST OF PREPARERS

The BLM selected an environmental consultant, Maxim Technologies, to support Utah BLM on this FMP EA. Therefore, the preparers of this EA included a combination of BLM and contract personnel.

5.4.1 BLM PREPARERS

The BLM's IDT assisted in the preparation of this EA and with the development and evaluation of the proposed fire management direction. BLM participants and their responsibilities are listed in **Table 5.3**. The BLM also assigned a contracting officer's representative and technical project lead with primary responsibilities for oversight of contractors, agency collaboration, and NEPA process.

TABLE 5.3: BLM PREPARERS

Name	Title	Document Section Responsibility
Jolie Pollet	Project Manager (Utah State Office)	Technical coordination
Matthew Higdon	NEPA Planner (Utah State Office)	Technical coordination, planning
Ambur Mathews	Environmental Specialist (Salt Lake Field Office)	NEPA, project coordination, quality control, environmental justice, socioeconomics
Rodd Hardy	Rangeland Management Specialist (Salt Lake Field Office)	Threatened and endangered plants, sensitive flora
Lori Hunsaker	Cultural Resource Specialist (Salt Lake Field Office)	Cultural resources, Native American religious concerns and consultation, paleontology
Pam Schuller	Environmental Specialist (Salt Lake Field Office)	Environmental justice, socioeconomics
Brook Chadwick	Fuels Management Specialist (Salt Lake Field Office)	Air quality, fuels management

Name	Title	Document Section Responsibility
Cindy Ledbetter	Rangeland Management Specialist (Salt Lake Field Office)	Soil, livestock grazing, vegetation including special status species, rangeland health standards and guidelines, floodplains, farmlands
Mike Gates	Lead Rangeland Management Specialist (Salt Lake Field Office)	Soil, livestock grazing, vegetation including special status species, rangeland health standards and guidelines, floodplains, farmlands
Gary Kidd	Natural Resource Specialist, ESR Coordinator (Salt Lake Field Office)	Invasive non-native species
Mark Arana	Wildlife Biologist (Salt Lake Field Office)	Water resources (surface/ground), wetlands/riparian areas
Randy Swilling	Wildlife Biologist (Salt Lake Field Office)	Threatened, endangered, or candidate species; threatened and endangered consultation; fish and wildlife, including special status fauna species
Mandy Rigby	Recreation Planner (Salt Lake Field Office)	Recreation, visual resources, wild and scenic rivers, wilderness study area, wilderness characteristics
Kyle Hansen	Wild Horse and Burro Specialist (Salt Lake Field Office)	Wild horses and burros, woodland/forestry
Dan Washington	Natural Resource Specialist , WUI Coordinator (Salt Lake Field Office)	Fire and fuels management
Tim Ingwell	Geologist (Salt Lake Field Office)	Waste (hazardous or solid)
Larry Garahana	Geologist (Salt Lake Field Office)	Geology and mineral resources
Mike Nelson	Realty Specialist (Salt Lake Field Office)	Lands and access
Jeff Kline	Fire Management Officer (Salt Lake Field Office)	Fire and fuels management

5.4.2 MAXIM TECHNOLOGIES PREPARERS

Maxim assembled a team of managers and senior resource specialists who formed the Maxim Technologies IDT (**Table 5.4**, below). They worked with BLM's IDT to provide NEPA project support and documentation.

TABLE 5.4: MAXIM TECHNOLOGIES PREPARERS

Name	Title	Document Section Responsibility
Jim Melton	Project Manager	Planning, NEPA
David Steed	Asst. Project Manager	USFWS consultation, planning, NEPA
Mike Egan	Asst. Project Manager	Planning, cultural resources, grazing
Milk Polk	Cultural Specialist	Cultural resources, Sagebrush sub-consultant

Name	Title	Document Section Responsibility
Susan Hatch	Biologist	Special status species, fish and wildlife, collaboration
Terry Grotbo	Senior NEPA & Planning Advisor	NEPA review
Fred Gifford	GIS Coordinator	GIS, database
Cameo Flood	Forester	Vegetation, woodlands and forests
Valerie Waldorf	Lead GIS Specialist	GIS, maps, figures
Wynn John	Environmental Engineer	Soil, water
Keith Clapier	Vegetation Specialist	Vegetation
Tennille Flint	Biologist	Wetlands, wilderness study areas, wilderness, recreation
Nancy Linscott	Socioeconomics Specialist	Socioeconomics, environmental justice
Dale-Marie Herring	Technical Writer/Coordinator	Writing, editing, coordination

CHAPTER 6. ACRONYMS, GLOSSARY, AND REFERENCES

6.1 ACRONYMS

AMPs	Allotment Management Plans
ACEC	Area of Critical Environmental Concern
AMR	Appropriate Management Response
BA	Biological Assessment
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
DWFC	Desired Wildland Fire Condition
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
ESR	Emergency Stabilization and Rehabilitation
FMP	Fire Management Plan
FMU	Fire Management Unit
FR	Fire Regime
GAP	Gap Analysis Program
IDT	Interdisciplinary Team
LUP	Land Use Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
OHV	Off-highway Vehicle
RDCC	Resource Development Coordinating Committee
RMP	Resource Management Plan
ROI	Region of Influence
RPM	Resource Protection Measure
SLFO	Salt Lake Field Office
TMDL	Total Maximum Daily Load
UDWR	Utah Division of Wildlife Resources
WSA	Wilderness Study Area
WUI	Wildland Urban Interface

6.2 GLOSSARY

Agency	Any federal, state, or county government organization participating with jurisdictional responsibilities.
Air Quality	The characteristics of the ambient air (all locations accessible to the general public) as indicated by concentrations of the six air pollutants for which national standards have been established (e.g., particulate matter, sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, and lead), and by visibility in mandatory federal Class I areas. For the purposes of the Utah Smoke Management Plan, concentrations of particulate matter are taken as the primary indicators of ambient air quality.
Alternative	One of at least two proposed means of accomplishing planning objectives.
Ambient Air	Literally, the air moving around us; the air of the surrounding outside environment.
Analysis	The examination of existing and/or recommended management needs and their relationships to discover and display the outputs, benefits, effects, and consequences of initiating a Proposed Action Alternative.
Appropriate Management Response (AMR)	Specific actions taken in response to a wildland fire to implement protection of life and resources. Responses range from full suppression to managing fire for resource benefits (fire use).
Area of Critical Environmental Concern (ACEC)	An area of public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and provide safety from natural hazards.
Aspect	Direction toward which a slope faces.
Assessment	The act of evaluating and interpreting data and information for a defined purpose.
Biological Treatment	Biological treatment of vegetation could typically employ grazing by cattle, sheep, or goats, but as technology progresses, it may also include insects, but would not include the use of invertebrates or microorganisms.
Biomass	The dry weight of plants in a unit area.
Brush	A collective term that refers to stands of vegetation dominated by shrublands, shrubby woody plants, or low-growing trees.
Buffer Zones	An area of reduced vegetation that separates wildland from vulnerable residential or business developments or other high-value areas. This barrier is similar to a greenbelt in that it is usually used for another purpose such as agriculture, recreation areas, parks, or golf courses.

Chaining	The process of modifying vegetation by pulling an anchor chain between two crawler tractors, thus reducing tall-growing, brittle vegetation and enhancing grasses, forbs, and sprouting shrubs.
Chemical Treatment	The use of herbicide to control herbaceous and woody species. BLM would use EPA-approved herbicides in accordance with EPA's Endangered Species Pesticide Program covered in BLM's *Vegetation Treatment on BLM Lands in Thirteen Western States FEIS* (May 1991).
Climax	A terminal stage of ecological succession in which the vegetation association remains stable over a relatively long period.
Closure	Legal restriction – but not necessarily elimination – of specified activities such as smoking, camping, or entry that might cause fires in a given area.
Collaboration	A cooperative process in which interested parties, often with widely varied interests, work together to seek solutions with broad support, for managing public and other lands.
Composition	The numbers and kinds of plants and animals in an area.
Condition Class	Condition class is a classification of the amount of departure from the natural condition. The three classes are based on low (condition class 1), moderate (condition class 2), and high (condition class 3) departure from the central tendency of the natural (historical) regime. See: www.frcc.gov.
Critical Habitat	Federally-mandated (under the ESA of 1973, as amended) designation for threatened or endangered species that is proposed, designated, and managed by the U.S. Fish and Wildlife Service.
Critical Seasonal Use Area	Designation provided by the Utah Division of Wildlife Resources for the most important / valuable big game seasonal use areas in the state that they manage.
Crown Fire (Crowning)	The movement of fire through the crowns (top) of trees or shrubs more or less independently of the surface fire.
Cultural Resources	Those resources of historical, archaeological, or paleontological significance. Non-renewable elements of the physical and human environment including archaeological remains (evidence of prehistoric or historic human activities) and sociocultural values traditionally held by ethnic groups (sacred places, traditionally used raw materials, etc.).
Cumulative Effects	Cumulative effects result from the impacts of past, present, and reasonably foreseeable future activities combined with the projected direct and indirect effects of each alternative considered.
Direct Effects	Direct effects are those consequences that are expected to occur following implementation of an alternative. Direct effects are caused by the action and occur at the same time and place as the action.

Disturbance	Any relatively discrete event, either natural or human-induced that causes a change in the existing condition of an ecological system.
Ecosystem	An arrangement of organisms defined by the interactions and processes that occur between them. Ecosystems are often defined by their composition, function, and structure.
Ecosystem Sustainability	The ability to sustain diversity, productivity, resilience to stress, health, renewability, and/or yields of desired values, resource uses, products, or services from an ecosystem while maintaining the integrity of the ecosystem over time.
Emergency Stabilization and Rehabilitation (ESR)	Planned actions to stabilize and prevent unacceptable degradation to natural and cultural resources after unplanned wildfires.
Endangered Species	Any animal or plant species in danger of extinction in a portion of its range. This is a federal designation (under the ESA of 1973 as amended). Most of these species fall under the jurisdiction of the U.S. Fish and Wildlife Service.
Endemic	A species restricted to a given geographical location and which is native to that locale.
Environment	All that surrounds an organism and interacts with it.
Environmental Assessment (EA)	EAs were authorized by NEPA of 1969. They are concise, analytical documents prepared with public participation that determine whether an Environmental Impact Statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.
Environmental Impact Statement (EIS)	EISs were authorized by NEPA of 1969. Prepared with public participation, they assist decision makers by providing information, analysis, and an array of action alternatives, allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.
Environmental Justice	The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.
Ephemeral	A stream that flows only in direct response to precipitation, and whose channel is above the water table at all times.

Fine (Light) Fuels

Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which is less than ¼-inch in diameter and has a time lag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Fire Intensity

A general term relating to the heat energy released by a fire.

Fire Management Plan (FMP)

A FMP is a functional activity plan for the fire management program. The FMP is the primary tool for translating programmatic direction developed in the land management plan into on-the-ground action. The FMP synthesizes broad fire management goals and places them into a strategic context. Criteria for making initial action decisions must be a component of the FMP.

Fire Management Unit (FMU)

Any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that set it apart from management characteristics of an adjacent unit. FMUs are delineated in FMPs. These units have dominant management objectives and pre-selected strategies assigned to accomplish these objectives.

Fire Regime

The fire pattern across the landscape, characterized by occurrence interval and relative intensity. Fire regimes result from a unique combination of climate and vegetation. Fire regimes exist on a continuum from short-interval, low-intensity fires to long-interval, high-intensity fires. The five natural (historical) Fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes include:

- I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced).
- II – 0-35 year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced).
- III – 35-100+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced).
- IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced).
- V – 200+ year frequency and high (stand replacement) severity. (See www.frcc.gov).

Fire Return Interval

The number of years between two successive fires in a designated area.

Fire Season

1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities. 2) A legally enacted time during which burning activities are regulated by state or local authority.

Fire Severity	Fire severity is a product of fire intensity and residence time at a site. Severity denotes the effects, from low to high, of fire on the soil and vegetation components of a site.
Fire Use	The combination of wildland fire use and prescribed fire application to meet resource objectives.
Fireline	A linear fire barrier that is cleared of fuels and scraped or dug to mineral soil. Also called control line, containment line or line.
Forage	Vegetation of all forms available and of a type used for animal consumption.
Forbs	Plants with soft, rather than permanent, woody stem that are not grass or grass-like plants.
Forest Products	Woodland and timber products, such as posts, poles, firewood, and Christmas trees.
Fuel	A combustible material, including vegetation such as grass, leaves, ground litter, plants, shrubs, and trees that feed a fire. (See Surface Fuels.)
Fuel Reduction	Manipulation, including combustion and/or removal of fuel to reduce the likelihood of high intensity wildland fire. Fuel reduction lessens the potential damage and severity of wildland fire.
Fuel Management	The practice of evaluating, planning, and executing the treatment of wildland fuel to control flammability and reduce the resistance to control through mechanical, chemical, biological, or manual means, or by prescribed and wildland fire, in support of land management objectives.
Fuel Type	An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that would cause a predictable rate of fire spread or difficulty of control under specified weather conditions.
Goal	A concise statement that describes a desired condition to be achieved sometime in the future. It is normally expressed in broad, general terms (usually not quantifiable) and is timeless in that it has no specific date by which it is to be completed. Goal statements form the principle basis from which objectives are developed.
Grazing Permit	An authorization that allows grazing on public lands. Permits specify class of livestock on a designated area during specified seasons each year. Permits are of two types: preference (10 year) and temporary non-renewable (1 year).

Guideline	Actions or management practices that may be used to achieve desired outcomes, sometimes expressed in Best Management Practices (BMPs). Guidelines may be identified during the land use planning process, but they are not considered a land use decision unless the plan specifies that they are mandatory. Guidelines for grazing administration must conform to 43 CFR 4180.2
Habitat	A specific set of physical conditions in geographical area(s) that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are: food, water, cover and living space.
Implementation Plan	A sub-geographic or site-specific plan written to implement decisions made in a LUP. Implementation plans include both activity plans and project plans.
Incident	A human-caused or natural occurrence, such as wildland fire, that requires emergency service action to prevent or reduce the loss of life or damage to property or natural resources. Incident management teams also handle other non-fire emergency response, including tornadoes, floods, hurricanes, earthquakes, and other disasters or large events.
Indirect Effects	Indirect effects are those consequences, which are expected to occur following implementation of an alternative. Indirect effects are caused by the action and occur later in time or farther from the activity.
Interdisciplinary Team (IDT)	A team representing several disciplines to ensure coordinated planning of the various resources.
Intermittent or Seasonal Stream	A stream that flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas.
Ladder Fuels	Fuels which provide vertical continuity between strata and allow fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.
Land Use Plan (LUP)	A set of decisions that establish management direction for land within an administrative area. An assimilation of land-use-plan-level decisions developed through the planning process outlined in 43 CFR 1600, regardless of the scale at which the decisions were developed. The term includes both RMPs and MFPs.

Landscape	An area of interacting and interconnected patterns of habitats (ecosystems) that are repeated because of the geology, land form, soil, climate, biota, and human influences throughout the area. Landscape structure is formed by disturbance events, successional development of landscape structure, and flows of energy and nutrients through the structure of the landscape. A landscape is composed of watersheds and smaller ecosystems. It is the building block of biotic provinces and regions.
Large Fire	1) For statistical purposes, a fire burning more than 100 acres. 2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.
Light (Fine) Fuels	Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which is less than ¼-inch in diameter and has a time lag of one hour or less. These fuels ignite readily and are rapidly consumed by fire when dry.
Litter	Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.
Long-erm	Defined in this document as 10 years or more. This applies to any long-term use.
Major	The impact is severe; there would be a highly noticeable, permanent change.
Management Concern	An issue, problem, or condition that constrains the range of management practices identified by the BLM in the planning process.
Management Direction	A statement of multiple-use and other goals and objectives, associated management prescriptions, and standards and guidelines for attaining them.
Management Framework Plan (MFP)	A LUP for public lands administered by BLM that provides a set of goals, objectives, and constraints for a specific planning unit or area; a guide to the development of detailed plans for the management of each resource. This form of plan is now being replaced with RMPs.
Management Practice	A specific activity, measure, course of action, or treatment.
Mechanical Treatment	Mechanical treatments of vegetation employ several different types of equipment to suppress, inhibit, or control herbaceous and woody vegetation. For the purposes of this plan, mechanical treatments may include employing the following: cabling, chaining, disking (or disk plowing), bulldozing, mowing, beating, crushing, chopping or shredding vegetation using a variety of mechanized equipment.
Microbiotic Crust	Microbiotic crusts are produced by living organisms and their by-products that bind together soil particles at, or very near, the ground surface

Minor	The impact is slight but detectable; there would be a small change.
Moderate	The impact is readily apparent; there would be a measurable change that could result in a small but permanent change.
Monitoring (Plan Monitoring)	The process of tracking the implementation of LUP decisions and collecting and assessing data and/or information necessary to evaluate the effectiveness of land use planning decisions.
National Environmental Policy Act (NEPA)	NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes EISs and EAs to be used as analytical tools to help federal managers make decisions on management of federal lands.
Naturalness	An area which "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable". (Section 2[c], *Wilderness Act*).
Negligible	The impact is at the lower level of detection; there would be no measurable change.
Non-fire Fuel Treatments	Includes manual, mechanical, biological, chemical, and seeding actions.
Objective	A concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.
Off-road Vehicle (ORV)	Any motorized vehicle designated for or capable of cross-country travel over lands, water, sand, snow, ice, marsh, swampland, or other terrain excluding: (1) any non-amphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle used in national defense.
Old Growth	A wooded area, usually greater than 200 years of age, which has never been altered or harvested by humans. An old-growth forest often has large individual trees, a multi-layered crown canopy, and a significant accumulation of coarse woody debris including snags and fallen logs. Utah BLM would adopt the U.S. Forest Service (USFS) old-growth definitions and identification standards per the USFS document *Characteristics of old-growth forests in the intermountain region*" (April 1993). In instances where the area of application in the previous document doesn't apply to specific species (e.g., *Pinus edulis*), use the document *Recommended old-growth definitions and descriptions, UDSA Forest Service southwestern region* (Sept.1992).

Perennial	A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.
Planning Area	The geographic area that includes BLM-administered lands being analyzed in this EA as well as lands with other ownership. It is contiguous with one or more field office boundaries.
Planning Unit	As used in previous BLM planning, a geographical unit within a BLM district. It included related lands, resources, and use pressure problems that were considered together for resource inventory and planning.
Prescribed Fire	Any fire ignited by management actions under certain predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written prescribed fire plan must exist, and NEPA requirements must be met prior to ignition.
Prescription	Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of AMRs, and indicate other required actions. Prescription criteria may include a combination of safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.
Prevention	Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.
Public Lands	Any lands or interest in lands outside of Alaska owned by the United States and administered by the Secretary of the Interior through the BLM, except located on the Outer Continental Shelf and lands held for the benefit of Indians.
Public Participation	The process of attaining citizen input into each planning document development stage. It is required as a major input into the BLM's planning system.
Range Improvements (Structural / Nonstructural)	Any activity or program on or relating to rangelands designed to improve forage production, change vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, and enhance habitat for livestock, wildlife, and wild horses and burros. Rangeland improvements include non-structural land treatments (such as chaining, seeding, and burning), and structural (such as stockwater developments, fences, and trails).
Rangeland	Land dominated by vegetation that is useful for grazing and browsing by animals. "Range" and "rangeland" are used interchangeably.
Raptors	Birds of prey, such as the eagle, falcon, hawk, owl, or vulture.
Recreation Opportunities	Favorable circumstances enabling visitors' engagement in a leisure activity to realize immediate psychological experiences and attain more lasting, value-added beneficial outcomes.

Region	May be any geographical area larger than a planning area (Socio-Economic Profile Area, sub-State, State, Multi-State, or National), appropriate for comparative area analysis and for which information is available. Regions may be different for different resources or subject matter analysis.
Resource Management Plan (RMP)	A document prepared by field office staff with public participation and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.
Resources	1) Personnel, equipment, services, and supplies available or potentially available for assignment to incidents. 2) The natural resources of an area, such as timber, grass, watershed values, recreation values, and wildlife habitat.
Retardant	A substance or chemical agent that reduces the flammability of combustibles.
Riparian Habitat	A native environment growing near streams, reservoirs, ponds, etc. that provides food, cover, water, and living space (permanent or intermittent). It is usually unique or limited in arid regions and is, therefore, of great importance to a wide variety of wildlife.
Seeding (and Planting)	Involves the introduction of seeds and plants to a site that alters existing plant communities and influences successional processes.
Sensitive Species	Species not yet officially listed but that are undergoing status review for listing on the Fish and Wildlife Service official threatened and endangered list; species whose populations are small and widely dispersed or restricted to a few localities; and species whose numbers are declining so rapidly that official listing may be necessary.
Severity	Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time (duration) of the fire. Severity denotes the effects, from low to high, of fire on the soil and vegetation components of a site.
Short-term	Defined in this document as one to five years. This applies to any "short-term" use.
Slash	Debris left after logging, pruning, thinning, or brush cutting; includes logs, chips, bark, branches, stumps, and broken understory trees or brush.
Smoke Management	Conducting a prescribed fire under fuel moisture and meteorological conditions, and with firing techniques that keep the smoke's impact on the environment within acceptable limits.
Soil Compaction	Increasing the soil bulk density, and concurrently decreasing the soil porosity, by the application of mechanical forces to the soil.

Soil Disturbance	Physical disturbance of the vegetation or soil surface by any action, usually via mechanical or manual tools. Includes all activities except casual use, wildland fire, and prescribed fire treatments. See Surface Disturbance.
Special Recreation Management Areas	Recreation management areas that receive emphasis and priority in BLM's recreation planning and management efforts. The recreation resources in these areas require explicit management to provide specified recreation setting, activity, and experience opportunities. Recreation management objectives would provide explicit guidelines with respect to the existing opportunities and problems in these areas. RMPs would subsequently be prepared for special recreation management areas using RMP objectives for guidance.
Special Status Species (SSS)	Includes proposed species, listed species, and candidate species under the ESA; state-listed species; and BLM state director-designated sensitive species (see BLM Manual 6840, Special Status Species Policy).
State Lands	Lands controlled or administered by the State of Utah.
Stocking	The extent to which forestland is occupied by trees of specified classes. Classifications of forestland and forest types are based on stocking of all live trees. Classifications of condition classes are based on stocking of desirable trees.
Strategy	The science and art of command as applied to the overall planning and conduct of an incident.
Structure	The sizes, shapes, and/or ages of the plants and animals in an area.
Succession	Observed process of change in the species structure (and composition) of an ecological community over time.
Suppression	A management action intended to extinguish a fire or alter its direction of spread.
Surface Disturbance	Any surface disturbing activity (does not include fire).Disturbance of the vegetative or soil surface by any action. Includes all activities but casual use and (wildland fire) or fire treatments. See Soil Disturbance.
Surface Fuels	Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.
Sustainability	The ability to maintain a desired condition or flow of benefits over time.
Tactics	Deploying and directing resources on an incident to accomplish the objectives designated by strategy.

Total Maximum Daily Load (TMDL)	An estimate of the total quantity of pollutants (from all sources: point, non-point, and natural) that may be allowed into waters without exceeding applicable water quality criteria.
Values At Risk	To rate according to a relative estimate of worth when exposed to a chance of loss or damage.
Vegetation Treatment	Changing the characteristics of an established vegetation type to decrease fuel density and improve rangeland health or wildlife habitat. Treatments are designed for specific areas and differ according to the area's suitability and potential. The most common land treatment methods alter the vegetation with mechanical treatments (including seeding) and prescribed fire.
Vegetation	Plants in general or the sum total of the plant life above and below ground in an area.
Visibility	The greatest distance in a given direction where it is possible to see and identify with the unaided eye a prominent dark object against the sky at the horizon.
Wetlands	Lands including swamps, marshes, bogs, and similar areas, such as wet meadows. They also include river overflows, mud flats, and natural ponds.
Wilderness Area	An area officially designated as wilderness by Congress. Wilderness areas would be managed to preserve wilderness characteristics and shall be devoted to the public purposes of recreation, scenic, scientific, educational, conservation, and historical use.
Wilderness Study Area (WSA)	Areas under study for possible inclusion as a Wilderness Area in the National Wilderness Preservation System.
Wilderness	An area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitations.
Wildland Fire	Any non-structure fire, other than prescribed fire, that occurs in the wildland.
Wildland	Any area under fire management jurisdiction of a land management agency.
Wildland Fire Situation Analysis (WFSA)	A decision making process that evaluates alternative management strategies against selected criteria (e.g., safety, environmental, social, political, economic), and resource management objectives.

Wildland Fire Suppression	An AMR to wildland fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire. All wildland fire suppression activities provide for firefighter and public safety as the highest consideration, but minimize loss of resource values, economic expenditures, and/or the use of critical firefighting resources.
Wildland Fire Use (WFU)	The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in an FMP. Operational management is described in the WFIP. Wildland fire use is not to be confused with "fire use", a broader term encompassing more than just wildland fires. (The Salt Lake Field Office does not use wildland fire use)
Wildland Urban Interface (WUI)	The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Because of their location these structures are extremely vulnerable to fire should an ignition occur in the surrounding area.
Woodland	Forest lands stocked with other than timber species (i.e., pinyon, juniper, mountain mahogany, etc.). A plant community in which, in contrast to a typical forest, the trees are often small, and relatively short compared to their crown (i.e., pinyon, juniper). Uses of the woodland products are generally limited to firewood, posts, and harvest of fruit (pinyon nuts).

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APPENDIX A
Interdisciplinary Team Analysis Record Checklist

INTERDISCIPLINARY TEAM ANALYSIS RECORD CHECKLIST

Project Title: Salt Lake Fire Management Plan Environmental Assessment

NEPA Log Number: SLFO UT-020-2004-0091

File/Serial Number:

Project Leader: Jeff Kline, Ambur Mathews

FOR EAs/CXs: NP: not present; NI: resource/use present but not impacted, or has impacts that do not need to be analyzed in detail for the reasons described; PI: potentially impacted

STAFF REVIEW OF PROPOSAL:

NP/NI/PI NC	Resource	Date Reviewed	Signature	Review Comments
CRITICAL ELEMENTS				
NI	Air Quality	11/1/2005	Brook Chadwick	The FMP EA represents decisions that are of planned ignitions and treatments containing mitigation measures. Impacts from unplanned wildfire, adjacent to or within non-attainment areas, meeting targets of containment would not be impacting areas in excess of planned targets. Decisions state that fire would be of planned acreages that would not impact non-attainment areas. RPMs would be followed in prescribed burn plans according to State implementation plans and memorandums of understanding (MOUs) to eliminate impacts.
NI	Areas of Critical Environmental Concern	11/2/2005	Pam Schuller	Management prescriptions would ensure that importance and relevance criteria for each area of critical environmental concern (ACEC) are not compromised. Protective measures would identify allowable uses and limits which would be reflected in project design.
PI	Cultural Resources (Including Native American Religious Concerns)	11/1/2005	Lori Hunsaker	Thousands of sites are located within the SLFO. Despite the proposed RPMs, the Proposed Action has a potential to impact some of these sites.
NI	Environmental Justice	11/1/2005	Pam Schuller	Minority and low income populations exist within the SLFO. Priority would be given to protecting all communities as defined by assistance strategies. Planned actions would be coordinated and developed with communities/other agencies in a manner that does not exclude persons/populations from participation or subject individuals to discrimination because of race, color, or national origin. Public outreach and opportunity to comment on the development and design of strategies has been ongoing through the

NP/NI/PI NC	Resource	Date Reviewed	Signature	Review Comments
				ENBB, open-house/workshop, and bulletins. Biological and technological parameters, including standard operating procedures (protection measures) would be equally applied. Therefore, disproportionately high and adverse human health or environmental effects would not be borne by minority or low income populations.
NI	Farmlands (Prime or Unique)	11/2/2005	Mike Gates	BLM manages land in the planning area that would qualify as prime or unique farmland. However, there is nothing in the action that would irreversibly convert any BLM lands to non-agricultural use or result in the potential loss of prime farmlands, as defined by the Farmland Protection Policy Act.
NI	Floodplains	11/1/2005	Mike Gates	Flood hazard or risk to human safety within the SLFO is not likely, but is probable and could occur. The State of Utah does not impose restrictions for floodplain management on BLM administered lands. Floodplains exist throughout the planning area but because actions in this proposal and alternative would not impact the functionality of floodplains, consistent with Executive Order (EO) #11988, this critical element would not be impacted. The Proposed Action Alternative and alternatives include provisions to avoid adverse effects and incompatible development in floodplains, consistent with the EO that mandates that agency actions minimize potential harm to or within the floodplain; reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore/preserve the natural and beneficial values served by floodplains.
NI	Invasive, Nonnative Species	11/2/2005	Gary Kidd	Current mandates include: Public Law 90-583, an Act that provides the control of noxious plants on land under the control or jurisdiction of the Federal Government, Oct 17, 1968; Federal Noxious Weed Act, PL 93-629 Section 15 Management of undesirable plants on Federal Lands, 1974 and Section 15 Farm Bill WO IB memo 91-266 that requires the BLM to address the issue of invasive nonnative plants in a manner that would resolve any resource conflicts or issues; The 13 Western States Final Environmental Impact Statement on BLM lands (BLM 1991) requires each office to designate a lead person trained in the management of undesirable plants, establish and fund an undesirable plant management program, implement cooperative agreements with other agencies, and establish integrated management systems to control undesirable plant species. Noxious Weed Act S 144 ES was passed October 10, 2004 108th Congress 2nd Session pertaining to noxious weed control and eradication; this Act is specifically to enter into an integrated weed

NP/NI/PI NC	Resource	Date Reviewed	Signature	Review Comments
				management program with neighboring partners. Further emergency stabilization and rehabilitation (ESR) policies require remedial action to reduce or eliminate threat. Monitoring also occurs and triggers immediate action to eradicate weeds.
PI	Threatened, Endangered, or Candidate Species - Plants	11/1/2005	Rodd Hardy	There may be unplanned impacts on listed/candidate plant species and a potential to impact occupied habitat.
PI	Threatened, Endangered, or Candidate Species – Animals	11/2/2005	Randy Swilling	There may be unplanned impacts on listed/candidate animal species and a potential to impact occupied habitat.
NI	Wastes (hazardous or solid)	11/1/2005	Tim Ingwell	There are three different categories involving hazardous or solid waste and fire actions: ▪ Air operations only into known hazmat sites; no on-the-ground suppression entry into existing hazmat sites; Hazardous Site Entry Policy, IM-2002-138: In order to enter hazmat sites that require any level of protection (Levels D, C, or B) certain health and safety requirements must be met, which are contained in OSHA regulations 29 CFR 1910.120 - HAZWOPER. The SLFO has a roster of names of employees who are authorized to enter sites with known or potential hazardous substance releases. The EPA has identified four categories of personal protective equipment (PPE), Level D (least protective) to Level A (most protective). In general, BLM employees encounter situations that require a minimal level of personal protective equipment. If Level B protection is warranted and necessary to perform on-site activities, all BLM employees are to withdraw and rely on a contractor or other hazmat response team support. No BLM employees are to enter a site that has been determined to require Level A protection. In general existing hazmat sites should be avoided for fire suppression activities and prescribed burning. Air suppression may be recommended for wildfires within hazmat sites. ▪ Limited ground disturbance from suppression may be authorized on a case-by-case basis; minimize ground disturbance in category 2 areas; ▪ Regular suppression activities; The SLFO would continue to monitor and update information concerning hazardous waste sites.

NP/NI/PI NC	Resource	Date Reviewed	Signature	Review Comments
				Employees who discover any unauthorized waste dump(s), or spill site(s), that contain indicators of potential hazardous substances (e.g., containers of unknown substances, pools of unidentifiable liquids, piles of unknown solid materials, unusual odors, or any materials out of place or not associated with an authorized activity) should take the following precautions: (1) treat each site as if it contains harmful materials, (2) do not handle, move or open any containers, inhale vapors, or make contact with any material, (3) move a safe distance upwind from the site, and (4) contact the appropriate personnel as outlined in the Hazardous Materials Incident Contingency Plan for further guidance. Wastes would not be discussed or considered further; waste would be avoided during planned actions.
PI	Water Quality (drinking / ground)	11/2/2005	Mark Arana	There may be an impact to water quality due to unplanned actions.
PI	Wetlands / Riparian Zones	11/1/2005	Mark Arana	There may be short-term impacts on riparian areas. The issue is primarily vegetation conversion (loss, change, improvement, degradation). After fire, these zones could be susceptible to invasive plants. Direct disturbance to vegetation, removal and disturbance can result in beneficial improvements to watershed condition and quality and temporary impacts on watershed/water quality from sedimentation/salinity. There are benefits from removal of weeds and fuel reduction projects.
NP	Wild & Scenic Rivers	11/2/2005	Mandy Rigby	There have been no wild and scenic rivers designated within the SLFO.
PI	Wilderness / Wilderness Study Area	11/1/2005	Mandy Rigby	There are no designated wilderness areas on BLM lands in the planning area. There could be short-term impacts on the naturalness, opportunities for solitude, and opportunities for primitive recreation in the wilderness study area (WSA).

NP/NI/PI NC	Resource	Date Reviewed	Signature	Review Comments
NI	Rangeland Health	11/2/2005	Mike Gates	Utah BLM standards & guidelines (S&Gs) would be followed and are incorporated into the Proposed Action Alternative (see resource protection measures for livestock and vegetation). Fire management decisions in the Proposed Action Alternative would not be contributing to any long-term failure. Fire management decisions could be used as a tool to achieve S&Gs.
PI	Livestock Grazing	11/1/2005	Mike Gates	There could be some impact to allotment use from loss of forage, conversion of vegetation, and threat to range improvements.
PI	Woodland/Forestry	11/2/2005	Kyle Hansen	There could be impacts on the availability of forest related products (including posts, fuel wood collection, etc.). The availability of biomass may be discussed in future actions relating to fuels reduction projects.
PI	Vegetation including Special Status Species	11/1/2005	Mike Gates	Impacts on plant species, including special status species (SSS), from fire and surface disturbing activities may occur through modification of vegetation type (acreage).
PI	Fish & Wildlife including Special Status Species	11/2/2005	Randy Swilling	There may be impacts on fish, wildlife (including SSS), and potential/occupied habitat. Short-term displacement, disturbance, alteration of habitat, degradation, or loss of vegetation. Impacts could occur to moose, elk, deer, pronghorn, and sage grouse.
PI	Soils	11/1/2005	Mike Gates	Direct impacts from suppression activities include erosion/sedimentation, infiltration/runoff, and salinity/erosion.
PI	Recreation	11/2/2005	Mandy Rigby	There may be short-term impacts on developed recreation sites and facilities.
NI	Visual Resource Management	11/1/2005	Mandy Rigby	Resource protection measures (RPMs) resolve concerns regarding fire management impacts on visual resource management (VRM).

NP/NI/PI NC	Resource	Date Reviewed	Signature	Review Comments
NI	Geology / Mineral Resources	11/2/2005	Larry Garahana	There would be no impacts on geology / mineral resources from fire activities. Mitigation measures would be implemented to avoid damage to mining equipment or structures if deemed necessary. Mining and mineral activity could be restricted during high fire danger.
NI	Paleontology	11/1/2005	Peter Ainsworth	RPMs resolve concerns regarding fire management impacts on paleontological resources. In the event that paleontological resources are discovered in the course of ground-disturbing activities, efforts should be made to protect these resources. BLM Manual and Handbook H-8270-1, Chapter III (A) and III (B) would be used in planning and implementing projects.
NI	Lands / Access	11/2/2005	Mike Nelson	Impacts would be addressed by RPMs. Proposed Action Alternative/alternative(s) would have beneficial and positive impacts. Mitigation measures would include closures for a minimum of two years, which is consistent with recreation guidelines.
PI	Socioeconomics	11/1/2005	Pam Schuller	The purpose of the alternative(s) would be to protect infrastructure and resources. The value of communities and resources would be balanced against the operating costs defined in a wildland fire situation analysis (WFSA) or fire program analysis (FPA) depending on a site specific scenario for a wildfire or planned actions. Positive impacts would be contracts to local communities, catering, employment, and money into the local economy through goods and services. Impacts on socioeconomic impacts are discussed further in this EA.

NP/NI/PI NC	Resource	Date Reviewed	Signature	Review Comments
NI	Wild Horses and Burros	11/2/2005	Kyle Hansen	There are two habitat management areas (HMAs) within the SLFO. Temporary fences would not restrict access to water sources. Management decisions for wild horses and burros would be mitigated by the RPMs in the Proposed Action Alternative. There could be a temporary loss of forage, which would be mitigated by ESR. Temporary efforts may be necessary to minimize activity in burned areas.
PI	Wilderness Characteristics	11/1/2005	Mandy Rigby	There may be short-term impacts on the naturalness, opportunity for solitude and primitive recreation, and any supplemental values of non-WSA lands with wilderness characteristics. The SLFO has received no new information to substantiate the reasonable probability of wilderness character existing outside of areas inventoried in 1999.

FINAL REVIEW

Reviewer Title	Date	Signature	Comments
NEPA / Environmental Coordinator	11/1/2005	Ambur Mathews	
Manager	11/2/2005	Glenn Carpenter	

APPENDIX B
Wildland Fire Management Legislation

Wildland Fire Management Legislation

Wildland Fire Management Policy	
Authority: The statutes cited herein authorize and provide the means for managing wildland fires.	
Protection Act of September 20, 1922 (42 Stat. 857; 16 USC 594)	Authorizes the Secretary of Interior to protect (and preserve, from fire, disease, or the ravages of beetles or other insects), timber owned by the United States upon the public lands, national parks, national monuments, Indian reservations, or other lands under the jurisdiction of the Department of Interior (USDI) owned by the United States.
Clark-McNary Act of 1928 (45 Stat. 221; 16 USC 487)	Authorizes technical and financial assistance to the states for forest fire control and for production and distribution of forest tree seedlings. (Sections One through Four were repealed by Cooperative Forestry Assistance Act of 1978.)
Federal Property and Administrative Service Act of 1949 (40 USC 471 et seq.)	Provides the government an economical and efficient system for procurement and supply of personal property and non-personal services.
Reciprocal Fire Protection Act, Act of May 27, 1955 (69 Stat. 66; 42 USC 1856a, 42 USC 1856)	Authorizes agencies that provide fire protection for any property of the United States to enter into reciprocal agreements with other fire organizations to provide mutual aid for fire protection.
Clean Air Act, Act of July 14, 1955, as amended (42 USC 7401 et seq.)	Provides for the protection and enhancement of the nation's air resources and applies to the application and management of prescribed fire.
Wilderness Act, Act of September 3, 1964 (16 USC 1131, 1132)	Provides for the designation and preservation of wilderness.
National Wildlife Refuge System Administration Act of 1966, as amended (80 Stat. 927; 16 USC 668dd through 668ee)	Provides guidelines and directives for administration and management of all areas in the National Wildlife Refuge System, including "wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas."
National Environmental Policy Act of 1969 (42 USC 4321)	Requires preparation of environmental impact statements for federal projects which may have a significant effect on the environment. Requires systematic, interdisciplinary planning to ensure integrated use of the natural and social sciences and the environmental design arts in making decisions about major federal actions that may have a significant effect on the environment.
Endangered Species Act of 1973 (16 USC 1531)	Provides for the protection and conservation of threatened and endangered fish, wildlife, and plant species. Directs all federal agencies to utilize their authorities and programs to further the purpose of the Act.
Disaster Relief Act, Act of May 22, 1974 (88 Stat. 143; 42 USC 5121)	Provides the authority for the federal government to respond to disasters and emergencies. Established the presidential declaration process and authorized disaster assistance programs.
Federal Fire Prevention and Control Act, Act of October 29, 1974 (88 Stat. 1535; 15 USC 2201)	Authorizes reimbursement to state and local fire services for costs incurred in firefighting on federal property.
Federal Land Policy and Management Act of 1976 (90 Stat. 2743)	Outlines functions of the BLM Directorate, provides for administration of public land through the BLM, provides for management of the public lands on a multiple use basis, and requires land-use planning including public involvement

Wildland Fire Management Policy	
	and continuing inventory of resources. Establishes as public policy that, in general, the public lands would remain in federal ownership. It also authorizes: ▪ Acquisition of land or interests in lands consistent with the mission of the Department and land use plans. ▪ Permanent appropriation of road use fees collected from commercial road users to be used for road maintenance. Collection of service charges, damages, and contributions and use of funds for specified purposes. ▪ Protection of resource values. ▪ Preservation of certain lands in their natural condition. ▪ Compliance with pollution control laws. ▪ Delineation of boundaries in which the federal government has right, title, or interest. ▪ Review of land classifications in land use planning and modification or termination of land classifications when consistent with land use plans. ▪ Sale of lands if the sale meets certain disposal criteria. ▪ Issuance, modification, or revocation of withdrawals. ▪ Exchange or conveyance of public lands if in the public interest. ▪ Outdoor recreation and human occupancy use. ▪ Management of the use, occupancy, and development of the public lands through leases and permits. ▪ Designation of federal personnel to carry out law enforcement responsibilities. ▪ Determination of the suitability of public lands for rights-of-way purposes (other than oil and gas pipelines) and specification of the boundaries of each right-of-way. ▪ Recordation of mining claims and reception of evidence of annual assessment work.
Federal Grant and Cooperative Agreement Act of 1977 (PL 950224, as amended by PL 97-258, September 13, 1982, 96 Stat. 1003; 31 USC 6301 - 6308)	Establishes criteria for a federal agency to use to determine whether a transaction is procurement or financial assistance. Establishes guidelines to bring about uniformity in the selection and use of procurement contracts, grants, and cooperative agreements.
Supplemental Appropriation Act, Act of September 10, 1982 (96 Stat. 837)	Authorizes the Secretary of Interior and Secretary of Agriculture to enter into contracts with state and local governmental entities, including local fire districts, for procurement of services in the preparedness, detection, and suppression of fires on any units within their jurisdiction.
Wildfire Suppression Assistance Act, Act of April 7, 1989 (PL 100-428, as amended by PL 101-11, April 7, 1989; 42 USC 1856).	Authorizes the Secretary of Agriculture to enter into agreements with fire organizations of foreign countries for assistance in wildfire protection.
Indian Self-Determination and Education Assistance Act (PL 93-638), as amended	Provides for the full participation of Indian tribes in programs and services conducted by the federal government for Indians and encouraged the development of human resources of the Indian people; establishes a program of assistance to upgrade Indian education.
National Indian Forest Resources Management Act (PL 101-630, November 28, 1990)	Requires the Secretary of Interior to undertake management activities on Indian forestlands, in furtherance of the United States trust responsibility for these lands. Activities must incorporate the principles of sustained yield and multiple use and include tribal participation.

Wildland Fire Management Policy	
Tribal Self-Governance Act of 1994 (PL 103-413)	Provides for native tribes to enter into annual funding agreements with Department of the Interior "to plan, conduct, consolidate, and administer programs, services, functions, and activities" administered by USDI that are of special geographic, historical, or cultural significance.
Clean Water Act of 1987, as amended (33 USC 1251)	Establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water.
Executive Order 12898, Environmental Justice, February 11, 1994 (59 FR 7629)	Requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.
Executive Order 13112, Invasive Species, February 3, 1999 (64 FR 6183)	Directs federal agencies to prevent introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause.
Migratory Bird Conservation Act of 1929, as amended (16 USC 715) and treaties pertaining thereto	Provides for habitat protection and enhancement of protected migratory birds.
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, January 10, 2001 (66 FR 3853)	Directs agencies within the executive branch to take certain actions to further implement the Migratory Bird Treaty Act, with the goal of promoting the conservation of migratory bird populations.
Wild and Scenic Rivers Act (PL 90-542)	Provides a national policy and program to preserve and protect selected rivers because of their outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values.
Archaeological Resource Protection Act	Expands the protections provided by the Antiquities Act of 1906 in protecting archaeological resources and sites located on public and Indian lands.
Executive Order 11514, Protection and Enhancement of Environmental Quality	Directs federal agencies to provide leadership in protecting and enhancing the quality of the nation's environment to sustain and enrich human life and to initiate measures to meet national environmental goals.
Executive Order 11593, Protection and Enhancement of the Cultural Environment	Requires federal agencies to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the nation by administering and initiating measures necessary to preserve, restore, and maintain federally owned sites, structures, and objects of historical, architectural, or archaeological significance.
Executive Order 11988, Floodplain Management	Requires federal agencies to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains.
Executive Order 11990, Protection of Wetlands	Directs federal agencies to provide leadership and to take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.
Executive Order 12866, Regulatory Planning and Review	Enhances planning and coordination with respect to both new and existing regulations; reaffirms the primacy of federal agencies in the regulatory decision-making process; restores the integrity and legitimacy of regulatory review and oversight; and makes the process more accessible and open to the public.
Colorado River Basin Salinity	Authorizes the construction, operation, and maintenance of works in the

Wildland Fire Management Policy	
Control Act	Colorado River Basin to control the salinity levels of the Colorado River.
National Historic Preservation Act of 1966, as amended (16 USC 470)	Expands protection of historic and archaeological properties to include those of national, state, and local significance. It also directs federal agencies to consider the effects of Proposed Action Alternatives on properties eligible for, or included in, the National Register of Historic Places.
Healthy Forest Restoration Act of 2003	Reduces the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes.
Wild and Scenic Rivers Act of 1968 (PL 90-542, as amended) (16 USC 1271-1287)	Provides for a National Wild and Scenic Rivers System and for other purposes.
These acts are codified (as referenced) in the United States Code which can be accessed at http://www4.law.cornell.edu/uscode.	
Policy Documents	
Federal Wildland Fire Management Policy and Program Review, December 18, 1995, USDI and USDA Final Report. Federal Wildland Fire Management Policy and Program Review, March 23, 1996, USDI and USDA Implementation Action Plan Review and Update of the 1995 Federal Wildland Fire Management Policy, January, 2001, USDI, USDA, DoE, DoD, DoC, EPA, FEMA, and NASF.	Provide a common approach to wildland fire by USDI and the U.S. Department of Agriculture. Encourages agencies to move the emphasis from fire suppression to integrating fire into the management of lands and resources consistent with public health and environmental quality considerations. Encourages managers to use fire as one of the basic tools for accomplishing resource management objectives.
Utah BLM Rangeland Health Standards and Guidelines, 1997.	Provides standards that spell out conditions to be achieved on BLM lands in Utah and guidelines that would be applied to achieve the standards.
Western Governor's Association (http://www.westgov.org/)	
A Collaborative Approach for Reducing Wildland Fire risks to Communities and the Environment: 10-Year Comprehensive Strategy, August 2001.	Outlines a comprehensive approach to the management of wildland fire, hazardous fuels, and ecosystem restoration and rehabilitation on federal and adjacent state, tribal, and private forest and rangelands in the United States, emphasizing measures to reduce the risk to communities and the environment.
A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year	Sets forth core principles was developed to guide the identification of goals for this strategy. These principles include such concepts as priority setting, accountability, and an open, collaborative process among multiple levels of government and a range of interests. The end results sought by all stakeholders are healthier watersheds, enhanced community protection, and diminished risk and consequences of severe wildland fires.

Wildland Fire Management Policy	
Comprehensive Strategy Implementation Plan, May 2002, 27p.	This community-based approach to wildland fire issues combines cost-effective fire preparedness and suppression to protect communities and the environment with a proactive approach that recognizes fire as part of a healthy, sustainable ecosystem.
National Academy of Public Administration (http://www.napawash.org/)	
Federal Fire Management: Limited Progress in Restarting the Prescribed Fire Program (GAO/RCED-91-42), December 5, 1990.	Reiterates that fire is beneficial and even necessary to wildlands. Where fire has been a historic component of the environment it is essential to continue that influence, and that attempts to exclude fire from such lands could result in unnatural ecological changes and increased risks created by accumulation of fuels on the forest floor. Supports the use of prescribed burn to achieve management objectives, when the risks of such a burn have been analyzed.
State of Utah Regulations and Local Government Plans	
Utah Administrative Code R317	Sets forth Utah regulation concerning water quality.
Utah Administrative Code R307	Sets forth Utah's regulation concerning air quality.
Bear River Association of Government 2004	Sets forth pre-disaster mitigation plan for northern Utah's Bear River District (Box Elder, Cache, and Rich Counties).
Mountainland Association of Government 2004	Sets forth pre-disaster hazard mitigation plan for Utah's Summit, Utah, and Wasatch Counties.
Wasatch Front Regional Council 2004	Sets forth pre-disaster mitigation plan for Utah's Wasatch Front: Davis, Morgan, Salt Lake, Tooele, and Weber Counties.

APPENDIX C
Wildland Fire Management Categories

Wildland Fire Management Categories

For the purposes of comparing the No Action Alternative with the Proposed Action Alternative in this EA, the planning area for both alternatives was divided into four fire management categories that define the role and response that wildland fire has in a particular ecosystem. These four fire management categories were labeled A, B, C, and D, and are defined below.

Category A: Where wildland fire is not desired.

Category A is designated for two primary reasons. First, wildland fires in these areas have adverse environmental impacts on the ecosystem. These impacts include such factors as the destruction of crucial wildlife habitat, conversion of native vegetation to exotic plant species, establishment of weed species, increased soil loss, reduced water quality, and damage to cultural and historical resources. The second reason for designating an area as a category A is primarily related to social, economic, and/or political concerns and impacts. These impacts include public and firefighter safety; threats to adjacent communities and property owners; threats to improvements such as residences, communication sites, industrial sites, and range improvements; smoke impacts on communities and airport operations; and disturbance to high use recreation areas.

Category A areas are where fire is not a regular, natural part of the ecosystem, or where fire has more harmful impacts than benefits to the ecosystem. Fire has generally played a negative role in these areas by altering the native vegetation and allowing introduction of exotic species such as cheatgrass. Introduction of these exotic species has changed the size and interval of fires and has altered the natural species composition of the sites disrupting the natural secession of the native plant communities. As a result, increased size and frequency of fires allows continued and increased disturbance to native plant communities, destroys wildlife habitat, and produces other adverse impacts on the ecosystem. Because the native species generally lack an ability to out compete introduced and exotic species following a fire, rehabilitation projects are required to establish desirable vegetation and prevent soil loss and other undesirable natural consequences. Key examples include the salt desert shrub, black sagebrush, and big sagebrush shrub communities.

Prescribed fire for resource management is not recommended nor desired in these units due to fire's adverse environmental impacts. However, prescribed fire may be used to establish fuelbreaks and perform hazardous fuel reduction when the benefits of mitigating the potential for a large spreading fire outweigh the impacts of the fuels management project. In addition, other forms of fuels management designed to protect these fire-sensitive areas are recommended and may include: mechanical manipulation, grazing management, seeding to less flammable and more desirable species, vegetative fuelbreaks, and other management actions.

Category B: Unplanned wildland fire is not desired but prescribed fire and/or non-fire fuel treatments may be used to achieve resource objectives. Mitigation would likely be required to protect resources.

Unplanned wildland fires in category B produce similar adverse and harmful impacts as in category A. This adverse response to wildland fires is due to a combination of fire sensitivity and abnormal wildland fuels accumulations that produce larger, more severe fires than would normally occur in a healthy ecosystem. Due to this, the primary objective is to limit and suppress wildland fires within these areas. However, category B areas may respond positively to properly managed and planned prescribed fires. Unlike category A areas, prescribed fire may be used to reintroduce fire into the ecosystem and meet resource management objectives. Small, limited fires can improve vegetation diversity and/or revitalize old decadent plant communities. In addition, prescribed fire is used to reduce hazardous fuel loadings, thus mitigating and reducing the impacts should a wildland fire occur. The key examples are those areas where the absence of fires has resulted in replacement of diverse vegetation communities with monotypic stands of less desirable species. These areas include dense stands of juniper or decadent stands of big sagebrush. These plant

communities may have little vegetation and age class diversity, resulting in accumulations of hazardous and volatile fuels.

Fuels management is a key to mitigating the negative impacts of unplanned wildland fire in these areas. Fuels management options may include prescribed fire, mechanical manipulation, seeding of less flammable and more desirable species, vegetation green-stripping, and other management strategies.

Category C: Wildland fire is desired. Constraints are present to protect values at risk. Prescribed fire and non-fire fuel treatments may also be used to achieve resource objectives.

These are areas where wildland fire is a natural part of the ecosystem. The health and diversity of the vegetation, soils and wildlife have evolved and are enhanced or dependent upon the natural consequences of fire. In normal circumstances, the existing native vegetation would naturally re-vegetate after fire. Key ecosystem examples include: juniper with perennial grasslands, aspen groves, and big sagebrush with perennial grasses, and other upper elevation plant communities. Although these ecosystems benefit from fires, use of it as a management tool may be limited by constraints. These constraints include threats to adjacent developments and residential communities, smoke impacts, lack of manageable fire boundaries, political concerns, and economics of management. Because unplanned wildland fires or wildland fires can be beneficial in these areas, the appropriate fire management response may utilize less aggressive suppression strategies and tactics that result in more acreage burned than under a more aggressive fire suppression response.

Prescribed fire use in these areas is recommended both to meet resource management objectives and as fuels management to mitigate the constraints that may limit using less aggressive suppression in wildland fire situations. Fuels management may be necessary to define more manageable wildland fire boundaries, to protect and minimize the severity and impact of wildland fires on existing plant communities, and to protect values in adjacent units (i.e., resource values, developments, etc.). Fuels management activities may involve prescribe fire, mechanical manipulation, fuelbreak development, and other management strategies.

Category D: Wildland fire is desired and there are no constraints associated with resource conditions, social, economic, or political considerations.

The ecosystem response in these areas is similar to category C; the appropriate management response would be taken. Most often the appropriate fire management response in these areas is to monitor the fire and let the fire play out its natural role in the ecosystem. The key ecosystem example for this category is the vegetation communities located in the mudflat areas. Vegetation in these areas is sparse and there is little to no threat to resource values, improvements, or adjacent ownerships. In addition, because of their isolation, social, economic, or political considerations are unlikely to occur.

APPENDIX D
Proposed and No Action Alternatives Acreage Goals

APPENDIX D: Proposed and No Action Alternatives Acreage Goals Maximum Allowable Acres for Fire Management Actions. The absence of acreage for a fuel treatment type indicates that no target has been set. However, site specific plans may be developed in the future allowing for fuel treatment projects.

				Wildland Fire Suppression			Note: Existing direction combines these categories	
	Salt Lake FMUs	Total FMU acres	Total BLM acres in FMU	Per Occurrence Burn Acreage Ceiling	Annual Burn Acreage Ceiling	Ten Year Burn Acreage	Prescribed Fire (10-year acreage target in veg type)	Non-Fire Treatments (10-year acreage target in veg type)
Proposed	A01	244,698	212,571	100	300	800		
Existing		245,223	211,087	100		300		
Proposed	A02	113,216	102,481	100	300	500		
Existing		113,276	97,530	100		500		
Proposed	A03	751,910	606,275	500	10,000	15,000	100 CG-WBS 100 CG-SDS	3,400 CG-WBS 17,400 CG-SDS
Existing		752,028	611,943	300		10,000	13,000	
Proposed	A04	2,197	1,501	10	30	100		200 J-WBS
Existing		2,235	1,168	100		500		
Proposed	A05	469,002	209,762	100	300	500		
Existing		469,161	206,739	100		100		
Proposed	A06	346,635	1,035	100	100	300		
Existing		347,750	1,444	Full Suppression				
Proposed	A07	28,949	22,703	100	100	300		
Existing		28,986	22,900	100		100		

				Wildland Fire Suppression			Note: Existing direction combines these categories	
	Salt Lake FMUs	Total FMU acres	Total BLM acres in FMU	Per Occurrence Burn Acreage Ceiling	Annual Burn Acreage Ceiling	Ten Year Burn Acreage	Prescribed Fire (10-year acreage target in veg type)	Non-Fire Treatments (10-year acreage target in veg type)
Proposed	A08	28,058	14,450	100	100	300		
Existing		28,058	8,738	100		500		
Proposed	A09	263,541	17,100	100	500	5,000		700 J-WBS
Existing		263,549	13,960	100		500		
Proposed	A10	164,620	33,944	10	100	500		700 J-WBS
Existing		157,998	33,320	100		500		
Proposed	A11	8,613	5,262	10	50	100		
Existing		8,615	5,567	200		200	400	
Proposed	A12	56,140	24,827	300	1,000	15,000	200 J-WBS	400 J-WBS
Existing		56,140	25,102	300		1,500		
Proposed	A13	18,208	10,982	1	10	100		160 WBS 80 MSL
Existing		18,230	10,387	100		500		
Proposed	A14	36,463	29,288	10	100	300		150 J-WBS 50 PJ
Existing		36,464	28,142	200		1,000	400	
Proposed	A15	19,924	12,543	500	1,000	15,000		
Existing		19,925	12,625	300		750		

				Wildland Fire Suppression			Note: Existing direction combines these categories	
	Salt Lake FMUs	Total FMU acres	Total BLM acres in FMU	Per Occurrence Burn Acreage Ceiling	Annual Burn Acreage Ceiling	Ten Year Burn Acreage	Prescribed Fire (10-year acreage target in veg type)	Non-Fire Treatments (10-year acreage target in veg type)
Proposed	A16	28,064	20,070	100	500	5,000		
Existing		28,063	21,173	1,000		2,500		
Proposed	A17	131,679	85,955	100	1,000	15,000		
Existing		131,571	85,093	300		1,500		
Proposed	A18	292,395	2,693	300	1,000	2,000		
Existing		292,610	3,301	Full Suppression				
Proposed	A19	27,807	324	300	500	3,000		
Existing		27,808	313	Full Suppression				
Proposed	A20	386,594	5,503	300	500	3,000		
Existing		387,519	4,842	Full Suppression				
Proposed	A21	783,191	947	10	100	300		
Existing		783,262	2,381	Full Suppression				
Proposed	B01	69,775	60,281	300	500	1,000		1,000 CG&J-WBS
Existing		70,238	59,231	300		1,000	1,000	
Proposed	B02	28,275	18,314	100	500	1,000		
Existing		28,301	14,639	300		1,500	1,000	
Proposed	B03	143,754	38,264	100	1,000	1,500		200 J-WBS

				Wildland Fire Suppression			Note: Existing direction combines these categories	
	Salt Lake FMUs	Total FMU acres	Total BLM acres in FMU	Per Occurrence Burn Acreage Ceiling	Annual Burn Acreage Ceiling	Ten Year Burn Acreage	Prescribed Fire (10-year acreage target in veg type)	Non-Fire Treatments (10-year acreage target in veg type)
Existing		144,157	29,052	400		1,500	2,400	
Proposed	B04	482,917	184,811	300	3,000	15,000	350 WBS	2,720 WBS
Existing		485,614	169,891	600		4,000	2,250	
Proposed	B05	393,149	214,606	500	3,000	15,000	50 CG-WBS	100 CG-WBS
Existing		393,152	212,106	500-Upland 100 des.		500-Upland 100 des.	1,000	
Proposed	B06	124,162	52,192	300	1,000	6,000	25 J-WBS	425 J-WBS
Existing		124,155	62,337	300		900	1,000	
Proposed	B07	138,336	79,045	100	3,000	12,000		
Existing		139,171	79,399	300		1,500	1,000	
Proposed	B08	281,981	96,776	100	300	1,500	200 WBS	3600 WBS
Existing		282,040	96,458	300		1,500	16,000	
Proposed	B09	318,496	12,731	100	300	500	200 A-WBS	200 A-WBS
Existing		318,512	11,271	500		1,500	720	
Proposed	B10	46,895	33,567	10	100	300		200 J-WBS
Existing		46,896	33,287	100		700	200	

				Wildland Fire Suppression			Note: Existing direction combines these categories	
	Salt Lake FMUs	Total FMU acres	Total BLM acres in FMU	Per Occurrence Burn Acreage Ceiling	Annual Burn Acreage Ceiling	Ten Year Burn Acreage	Prescribed Fire (10-year acreage target in veg type)	Non-Fire Treatments (10-year acreage target in veg type)
Proposed	B11	236,659	18,111	300	500	1,000	100 WBS	540 WBS
Existing		237,599	17,924	200		1,000	280	
Proposed	B12	995,850	14,882	10	100	300		
Existing		997,115	15,120	Full Suppression			1,000	
Proposed	B13	300,083	57,256	100	500	1,000		
Existing		300,093	56,254	Full Suppression			420	
Proposed	C01	45,125	44,222	100	300	3,000		400 PJ
Existing		45,160	39,102	(>60) 300		1,200	400	
Proposed	C02	40,476	34,396	300	800	1,200		200 J-WBS
Existing		40,892	27,122	(>100) 500		1,200	400	
Proposed	C03	107,831	100,181	100	1,000	2,000		
Existing		107,834	94,919	(>100) 500		2,000		
Proposed	C04	56,547	36,024	100	1,000	2,000		3,000 J-WBS
Existing		56,550	39,925	(>60) 300		1,500	400	
Proposed	C05	103,650	76,593	100	1,500	2,000		4,000 J-WBS
Existing		103,651	76,033	(>100) 500		2,000	1,200	

				Wildland Fire Suppression			Note: Existing direction combines these categories	
	Salt Lake FMUs	Total FMU acres	Total BLM acres in FMU	Per Occurrence Burn Acreage Ceiling	Annual Burn Acreage Ceiling	Ten Year Burn Acreage	Prescribed Fire (10-year acreage target in veg type)	Non-Fire Treatments (10-year acreage target in veg type)
Proposed	C06	27,766	23,778	500	1,000	3,000		
Existing		27,778	23,338	300		900		
Proposed	C07	8,849	7,430	100	300	1,000		
Existing		8,851	8,203	300		900		
Proposed	C08	21,665	18,750	100	300	1,000		
Existing		21,666	18,709	(>100) 500		1,200	400	
Proposed	D01	930,295	597,190	1,000	5,000	20,000		
Existing		930,315	595,494	No Targets				
Proposed	D02	1,745	1,088	1,000	1,089	10,890		
Existing		1,747	1,111					
Proposed	TOTAL	9,106,185	3,240,704	8,871	43,679	184,290	1,325	39,825
Existing		9,109,958	3,188,680	10,500		47,450	44,870	

Key: WBS=Wyoming big sagebrush, PJ=pinyon and juniper woodland, CG-SDS=salt desert shrub with infesting cheatgrass, CG-WBS = Wyoming big sage with infesting cheatgrass, J-WBS = Wyoming big sage with encroaching juniper, A-WBS = Wyoming big sage with decadent aspen

APPENDIX E
Resource Protection Measures under the Proposed Action Alternative

Resource Protection Measures included in the Proposed Action Alternative

Protection of human life is the most important goal for all RPMs. The RPMs follow the same order as the IDT Analysis Record Checklist (**Appendix A**).

CODE	PROTECTION MEASURES AND APPLICABLE FIRE MANAGEMENT PRACTICES	FIRE MANAGEMENT UNITS
	Air Quality	
AQ-1	Evaluate weather conditions, including wind speed and atmospheric stability, to predict impacts from smoke from prescribed fires. Coordinate with Utah Department of Environmental Quality for prescribed fires. (RX) (LUP A-1)	All
AQ-2	When using chemical fuels reduction methods, follow all label requirements for herbicide application. (NF)	All
	Cultural Resources	
CR-1	Cultural resource advisors should be contacted when fires occur in areas containing sensitive cultural resources. (SUP)	All
CR-2	Potential impacts of proposed treatment would be evaluated in compliance with the National Historic Preservation Act, in consultation with State Historic Preservation Office and Native American tribes. (RX, NF, ESR)	All
CR-3	In areas where cultural resources are at high risk, mechanical thinning and reintroduction of cooler, less-damaging low-intensity ground fire would be used to minimize the potential for damage to cultural resources. (RX, NF, ESR)	All
	Invasive, Non-Native Species	
INV-1	When restoring or rehabilitating disturbed rangelands, non-intrusive, nonnative plant species are appropriate for use when native species: (1) are not available; (2) are not economically feasible; (3) cannot achieve ecological objectives as well as nonnative species; and/or (4) cannot compete with already established native species. (RX, NF, ESR)	All
INV-2	In areas known to have weed infestations, aggressive action should be taken in rehabilitating firelines, seeding and follow-up monitoring and treatment to reduce the spread of noxious weeds. Monitor burned areas and treat as necessary. All seed used would be tested for purity and for noxious weeds. Seed with noxious weeds would be rejected. (SUP, RX, NF, ESR)	All
INV-3	Fuel treatments would be considered as needed by a site-specific plan in order to curb the conversion of vegetation types from native species domination to non-native species domination and juniper encroachment. (NF, RX)	All
INV-4	Prevent, control, eradicate noxious and invasive weed invasion using the Integrated Pesticide Management Program in accordance with the land use plan. (ESR, RX, NF)	C03-Cedar, C05 Onaqui, C08-Newfoundland
	Native American Religious Concerns	
NAT-1	Consultation would be completed on a project specific basis. (NF, RX, ESR)	All
	Threatened, Endangered, or Candidate Species (plants and animals)	
END-1	Initiate emergency Section 7 consultation with United States Fish and Wildlife Service (USFWS) upon the determination that wildfire suppression may pose a potential threat to any listed threatened or endangered species or adverse modification of designated critical habitat. (SUP)	All

CODE	PROTECTION MEASURES AND APPLICABLE FIRE MANAGEMENT PRACTICES	FIRE MANAGEMENT UNITS
END-2	Prior to planned fire management actions, survey for listed threatened and endangered and non-listed sensitive species. Initiate Section 7 consultation with USFWS as necessary if proposed project may impact any listed species. Review appropriate management, conservation and recovery plans and include recovery plan direction into project proposals. For non-listed special status plant and animal species, follow the direction contained in BLM Manual 6840. Ensure that any proposed project conserves non-listed sensitive species and their habitats and ensure that any action authorized, funded or carried out by BLM does not contribute to the need for any species to become listed. (RX, NF, ESR)	All
END-3	Survey for listed threatened and endangered and non-listed sensitive species. Review appropriate management, conservation, and include recovery plan direction into project proposals. For non-listed special status plant and animal species, follow the direction contained in BLM Manual 6840. Ensure that any proposed project conserves non-listed sensitive species and their habitats and ensure that any action authorized, funded, or carried out by BLM does not contribute to the need for any species to become listed. (ESR, NF, RX)	All
END-4	Wildfires would be kept as small as possible and intensity as low as possible to minimize damage to Lahontan cutthroat trout habitat. (SUP)	A04-Donner/Betridge
END-5	Wildfires would be kept as small as possible and intensity as low as possible to minimize damage to Bonneville cutthroat trout habitat. (SUP)	A-13-Laketown Canyon, B08-W Randolph, B09-Up Randolph, B10-Woodruff Cr
	Wastes (hazardous or solid)	
HAZ-1	Recognize hazardous wastes and move fire to a safe distance from dumped chemicals, unexploded ordnance, drug labs, wire burn sites or any other hazardous wastes. Immediately notify BLM field office hazmat coordinator or state hazmat coordinator upon discovery of any hazardous materials, following the BLM hazardous materials contingency plan. (SUP, RX, NF, ESR)	All
	Water Quality (drinking/ground)	
WQ-1	Suppress wildfires consistently with compliance strategies for restoring or maintaining the restoration of water quality impaired [303(d)-listed] waterbodies. Do not use retardant within 300 feet of waterbodies. (SUP)	All
WQ-2	Plan and implement projects consistent with compliance strategies for restoring or maintaining restoration of water quality impaired [303(d)-listed] waterbodies. Planned activities should take into account the potential impacts on water quality, including increased water yields that can threaten fisheries and aquatic habitat, improvements at channel crossings, channel stability, and downstream values. Of special concern are small headwaters of moderate to steep watersheds, erosive soils, multiple channel crossings, at-risk fisheries, and downstream residents. (RX, NF, ESR)	All
WQ-3	When using chemical fuel reduction treatments follow all label directions, additional mitigations identified in project National Environmental Policy Act (NEPA) evaluation and the Approved Pesticide Use Proposal. At a minimum, provide a 100-foot-wide buffer strip for aerial application, 25 feet for vehicle application and 10 feet for hand application. Any deviations must be in accordance with the label. Herbicides would be applied to individual plants within 10 feet of water where application is critical (BLM 1991). (NF)	All
WQ-4	When necessary, monitoring of water quality parameters and channel conditions following fire or other treatments would be completed. (ESR, NF, RX)	All
WQ-5	Prevent degradation of groundwater quality. (SUP, RX, NF, ESR)	All

CODE	PROTECTION MEASURES AND APPLICABLE FIRE MANAGEMENT PRACTICES	FIRE MANAGEMENT UNITS
	Wetlands/Riparian Zones	
WET-1	Avoid heavy equipment in riparian or wetland areas. During fire suppression consult a resource advisor before using heavy equipment in riparian or wetland areas. (SUP, RX, NF, ESR)	All
WET-2	Limit ignition within native riparian or wetland areas. Allow low-intensity fire to burn into riparian areas. (RX)	All
WET-3	Non-fire treatment methods would be used on 400 acres to reduce the potential for wildfires that would destroy the critical vegetation in the riparian zone of Bettridge Creek and Morrison Creek. This would also protect the Lahontan cutthroat trout population found within Bettridge Creek. (NF)	A04-Donner/Bettridge, B02-Lower Pilot Mt, C02-Pilot
WET-4	Fires would be kept as small as possible and fire intensity as low as possible to minimize damage to the Laketown, Pine Canyon, Lake Point, and Wendover, Utah's municipal watersheds. (SUP)	A04-Donner/Bettridge, A08-N Oquirrh Mt, A09-Rush V, B02-Lower Pilot Mt, C02-Pilot
WET-5	Water would not be taken from Lucin Pond or Pilot Spring Pond to protect Least Chub. (SUP)	A05-Lucin/Red Dome, B05-W Curlew/Matlin
	Wilderness, Wilderness Study Areas (H-8550-1, H-1742-1, Manual Section 1742)	
WILD-1	Fire management actions would rely on the most effective methods of suppression that are least damaging to wilderness values, other resources, and the environment, while requiring the least expenditure of public funds. (SUP)	A01-Elephant/Ibapah, A03-Skull Valley, A04-Donner/Bettridge, A05-Lucin/Red Dome, A07-Newfoundland, A08-N Oquirrh Mt, A09-Rush V, B01-Deep Cr/Clifton Fl, B02-Lower Pilot Mt, B03-Raft R Mt, C01-N Deep Crk, C02-Pilot, C03-Cedar, C04-Stand Mt, C06-Dugway, C08-Newfoundland
WILD-2	Minimum suppression tactics would be used. (SUP)	A01-Elephant/Ibapah, A03-Skull Valley, B01-Deep Cr/Clifton Fl, C01-N Deep Crk, C03-Cedar, C04-Stand Mt
WILD-3	Impacts from equipment used for seeding must be carefully planned to be the least intrusive method necessary to obtain a successful seeding. (ESR, RX, NF)	A01-Elephant/Ibapah, A03-Skull Valley, B01-Deep Cr/Clifton Fl, C01-N Deep Crk, C03-Cedar, C04-Stand Mt
WILD-4	Fire plans would adhere to interim management policy for lands under wilderness review to protect wilderness values. (NF, RX, ESR)	A01-Elephant/Ibapah, A03-Skull Valley, B01-Deep Cr/Clifton Fl, C01-N Deep Crk, C03-Cedar, C04-Stand Mt
WILD-5	Large fire camps should be placed outside the wilderness study area (WSA), when possible. (SUP)	A01-Elephant/Ibapah, A03-Skull Valley, B01-Deep Cr/Clifton Fl, C01-N Deep Crk, C03-Cedar, C04-Stand Mt

CODE	PROTECTION MEASURES AND APPLICABLE FIRE MANAGEMENT PRACTICES	FIRE MANAGEMENT UNITS
WILD-6	Prescribed fire and vegetation manipulation activities in the WSA cannot adversely impact wilderness values within the WSA and should avoid unnecessary impairment of the area's suitability for preservation as wilderness. (RX, ESR, NF)	A01-Elephant/Ibapah, A03-Skull Valley, B01-Deep Cr/Clifton Fl, C01-N Deep Crk, C03-Cedar, C04-Stand Mt
WILD-7	No chemical, mechanical, or biological means of fuels treatment would be allowed in the WSA. (NF)	A01-Elephant/Ibapah, A03-Skull Valley, B01-Deep Cr/Clifton Fl, C01-N Deep Crk, C03-Cedar, C04-Stand Mt
WILD-8	Hand or aerial seeding is permitted within the WSA to restore natural vegetation. Use of native species (does not include naturalized species such as crested wheatgrass) is required in the WSA. (ESR, NF, RX)	A01-Elephant/Ibapah, A03-Skull Valley, B01-Deep Cr/Clifton Fl, C01-N Deep Crk, C03-Cedar, C04-Stand Mt
WILD-9	Use of motorized equipment during mop-up should be minimized. (SUP)	A01-Elephant/Ibapah, A03-Skull Valley, B01-Deep Cr/Clifton Fl, C01-N Deep Crk, C03-Cedar, C04-Stand Mt
WILD-10	Prescribed burning may be used where necessary to maintain fire-dependent natural ecosystems. (RX)	A01-Elephant/Ibapah, A03-Skull Valley, B01-Deep Cr/Clifton Fl, C01-N Deep Crk, C03-Cedar, C04-Stand Mt
WILD-11	Efforts should be made to rehabilitate any impacts created by suppression activities prior to releasing fire crews and associated equipment following fire containment. (ESR, SUP)	A01-Elephant/Ibapah, A03-Skull Valley, B01-Deep Cr/Clifton Fl, C01-N Deep Crk, C03-Cedar, C04-Stand Mt
	Rangeland Health Standards and Guidelines	
R-1	Rangelands that have been burned by wildfire or prescribed fire would be ungrazed for a minimum of one complete growing season following the burn. (SUP, RX)	All
R-2	Rangelands that have been re-seeded or otherwise treated to alter vegetative composition, chemically or mechanically, would be ungrazed for a minimum of two complete growing seasons. (RX, NF, ESR)	All
LG-1	Coordinate with permittees regarding the requirements for non-use or rest of treated areas. (SUP, RX, NF, ESR)	All
	Woodland/Forestry	
WF-1	Identify, maintain, and restore forest and woodland old-growth stands to a pre-fire suppression condition. Utah BLM would adopt the U.S. Forest Service's (USFS) old-growth definitions and identification standards as per the USFS document *Characteristics of Old-Growth Forests in the Intermountain Region* (April 1993). In instances where the area of application in the previous document doesn't apply to specific species [for example, *pinus edulis* (small compact 2-needled pinion of southwestern United States)], use the document *Recommended Old-Growth Definitions and Descriptions, UDSA Forest Service Southwestern Region.* (Sept.1992) (SUP, RX, NF)	All

CODE	PROTECTION MEASURES AND APPLICABLE FIRE MANAGEMENT PRACTICES	FIRE MANAGEMENT UNITS
WF-2	During planning, evaluate opportunities to utilize forest and woodland products prior to implementing prescribed fire activities. Include opportunities to use forest and woodland product sales; although these products would not be the basis for fuel reduction. In forest and woodland stands, consider developing silvicultural (Silviculture is the art and science of controlling the establishment, growth, composition, and quality of forest vegetation for the full range of forest resource objectives) prescriptions concurrently with fuels treatment prescriptions. (RX, NF)	All
	Vegetation (Utah Standards and Guidelines for Healthy Rangelands 1997)	
V-1	Wildfires would be kept as small as possible and intensity as low as possible to minimize loss of the salt desert shrub vegetation type. (SUP)	A01-Elephant/bapah, A03-Skull Valley, A05-Lucin/Red Dome, A06-Bear R, A08-N Oquirrh Mt, A09-Rush V, A10-S Oquirrh Mt, A12-Lake Mtn, A14-Gold Hill, A16-Lakeside Mtn, A17-Rush V, A18-Hansel Mtn, A19-Antelope Is, A20-Curlew, Hansel, Blu, A21-Wasatch Fr, B02-Lower Pilot Mt, B05-W Curlew/Matlin, B06-Davis Mtn, B07-S Simpson, B13-Wetlands, C06-Dugway, C07-Old River Bed, D01-Bonneville, D02-Carrington Is
V-2	Wildfires would be kept as small as possible and intensity as low as possible to minimize loss of the salt desert shrub vegetation type and the loss of the hybrid oak species *Quercus gambelii turbinella*. (SUP)	A03-Skull Valley, A08-N Oquirrh Mt, D01-Bonneville
	Fish and Wildlife	
FW-1	Avoid treatments during nesting, fawning and other critical periods for wildlife. (RX, NF, ESR)	All
FW-2	Avoid if possible or limit the size of, wildland fires in crucial wildlife habitats such as, mule deer winter range, riparian and occupied sage grouse habitat. Use resource advisors to help prioritize resources and develop wildland fire situation analyses (WFSAs) and wildland fire implementation plans when crucial habitats may be impacted. (SUP)	All
FW-3	Minimize wildfire size and frequency in sagebrush communities where sage grouse habitat objectives would not be met if a fire occurs. Retain unburned islands and patches of sagebrush unless there are compelling safety, private property and resource protection or control objectives at risk. Minimize burn-out operations (to minimize burned acres) in occupied sage-grouse habitats when there are no threats to human life and/or important resources. (SUP)	All
FW-4	Establish fuel treatment projects at strategic locations to minimize size of wildfires and to limit further loss of sagebrush. Fuel treatments may include green-stripping to help reduce the spread of wildfires into sagebrush communities. (RX, NF)	All
FW-5	Prescribed fire may be used to meet wildlife objectives. Evaluate impacts to sage grouse habitat in areas where prescribed fire was used for resource benefit may be implemented. (RX)	All

CODE	PROTECTION MEASURES AND APPLICABLE FIRE MANAGEMENT PRACTICES	FIRE MANAGEMENT UNITS
FW-6	Create small openings in continuous or dense sagebrush (>30% canopy cover) to create a mosaic of multiple-age classes and associated understory diversity across the landscape to benefit sagebrush-dependent species. (RX, NF)	All
FW-7	On sites that are currently occupied by forests or woodland but historically supported sagebrush communities, implement treatments (fire, cutting, chaining, seeding etc.) to re-establish sagebrush communities. (RX, NF)	All
FW-8	Evaluate and monitor burned areas and continue management restrictions until the recovering and/or seeded plant community reflect the desired condition. (SUP, RX)	All
FW-9	Utilize the emergency stabilization and rehabilitation (ESR) program to apply appropriate post-fire treatments within crucial wildlife habitats, including sage grouse habitats. Minimize seeding with non-native species that may create a continuous perennial grass cover and restrict establishment of native vegetation. Seed mixtures should be designed to re-establish important seasonal habitat components for sage grouse. Leks should not be re-seeded with plants that change the vegetation height previously found on the lek. Forbs should be stressed in early and late brood-rearing habitats. In situations of limited funds for ESR actions, prioritize rehabilitation of sage grouse habitats. (ESR)	All
FW-10	Prescribed fires and mechanical/chemical treatments would be conducted at seasons of the year when impacts to wildlife would be minimized. Treatments would normally not occur during the period of March through July where conflicts with nesting raptors and passerine neotropical migratory songbirds exist. Where treatments are proposed in crucial big game and upland game habitats, the treatments would be timed and designed to minimize impacts to these species during these crucial time periods. (ESR, RX, NF)	All
	Soil	
S-1	Avoid heavy equipment use on highly erosive soils, (soils with low soil loss tolerance), wet or boggy soils and slopes greater than 30%, unless otherwise analyzed and allowed under appropriate NEPA evaluation with implementation of additional erosion control and other soil protection mitigation measures. (SUP, RX, NF, ESR)	All
S-2	There may be situations where high intensity fire would occur on sensitive and erosive soil types during wildland fire or prescribed fire. If significant areas of soil show evidence of high severity fire, then evaluate area for soil erosion potential and downstream values at risks and implement appropriate or necessary soil stabilization actions such as mulching or seeding to avoid excessive wind and water erosion. (SUP, RX)	All
S-3	Complete necessary rehabilitation on firelines or other areas of direct soil disturbance, including but not limited to water-barring firelines, covering and mulching firelines with slash, tilling and/or subsoiling compacted areas, scarification of vehicle tracks, off-highway vehicle (OHV) closures, seeding and/or mulching for erosion protection. (SUP, RX)	All
S-4	Mechanical operations would be limited to periods of low soil moisture to reduce risk of soil compaction. If this is not practical, evaluate sites, post treatment and if necessary, implement appropriate remediation, such as subsoiling, as part of the operation. (NF)	All
S-5	Treatments such as chaining, plowing and roller chopping shall be conducted as much as practical on the contour to reduce soil erosion (BLM 1991). (NF, ESR)	All
S-6	Fires in high country conifer habitats would be suppressed to minimize damage to the microbiotic crusts and soil. (SUP)	A01-Elephant/bapah, A02-Floating & Silver Isles, A04-Donner/Betridge,

CODE	PROTECTION MEASURES AND APPLICABLE FIRE MANAGEMENT PRACTICES	FIRE MANAGEMENT UNITS
		A05-Lucin/Red Dome, A06-Bear R, A07-Newfoundland, A08-N Oquirrh Mt, A09-Rush V, A10-S Oquirrh Mt, A11-Five Mile Pass, A12-Lake Mtn, A13-Laketown Cyn, A14-Gold Hill, A17-Rush V, A18-Hansel Mtn, A20-Curlew, Hansel, Blu, A21-Wasatch Fr, B01-Deep Dr/Clifton Fl, B02-Lower Pilot Mt, B03-Raft R Mt, B04-Semi Desert, B05-W Curlew/Matlin, B06-Davis Mtn, B07-S Simpson, B08-Davis Mtn, B09-Up Randolph, B10-Woodruff Cr, B11-Henry's Fk, B12-Upper Elev, B13-Wetlands, C01-N Deep Crk, C02-Pilot, C03-Cedar, C04-Stans Mt, C05-Onaqui, C06-Dugway, C07-Old River Bed, C08-Newfoundland
	Recreation	
REC-1	Wildland fire suppression efforts would preferentially protect special recreation management areas and recreation site infrastructure in line with fire management goals and objectives. (SUP)	All
REC-2	Vehicle tracks created off of established routes would be obliterated after fire management actions in order to reduce unauthorized OHV travel. (SUP, RX, NF, ESR)	All
REC-3	In an area were fire has occurred or where fire danger is high, target shooting, campfires, fireworks, and other fire causing activities may be restricted in specific areas identified. (RX, SUP)	All
	Visual Resources	
VR-1	Prescribed fire, fuel treatments, and rehabilitation would be designed to be consistent with visual resource management (VRM) classifications, minimizing the impacts to the landscape, where appropriate. This would include considering the form, line, color and texture of the characteristic landscape and mitigating any strong contrasts that are not consistent with the VRM class rating, especially in Class II areas. (ESR, RX, NF)	All
	Geology/Mineral Resources	
M-1	A safety buffer should be maintained between fire management activities and at-risk facilities. (SUP, RX)	All
	Paleontology	
P-1	Planned projects should be consistent with BLM Manual and Handbook H-8270-1, Chapter III (A) and III (B) to avoid areas where significant fossils are known or predicted to occur or to provide for other mitigation of possible adverse effects. (RX, NF, ESR)	All

CODE	PROTECTION MEASURES AND APPLICABLE FIRE MANAGEMENT PRACTICES	FIRE MANAGEMENT UNITS
P-2	In the event that paleontological resources are discovered in the course of surface fire management activities, including fires suppression, efforts should be made to protect these resources. (SUP, RX, NF, ESR)	All
	Lands/Access	
LA-1	Fire management activities shall be designed to avoid or otherwise ensure the protection of authorized right-of-ways and other facilities located on the public lands, including coordination with holders of major right-of-way systems within right-of-way corridors. (RX, NF, ESR)	All
LA-2	Fire management actions must not destroy, deface, change or remove to another place any monument or witness tree of the public land survey system. (SUP, RX, NF, ESR)	All
LA-3	Protection of rehabilitated units could involve fences, herding, signing, closing of roads, restricting access to public, public education, and use supervision patrolling. (ESR)	All
LA-4	Suppress fires to protect private lands and structures. (SUP)	All
LA-5	If found to be necessary as a result of a hazard assessment, a fire plan may be initiated with private property owners in conjunction with the state and county cooperators. (NF, RX)	All
LA-6	In cooperation with local communities and cooperating agencies, prevent human-caused wildfires to protect people, communities, private lands, and resources. (RX, NF, ESR)	All
	Wild Horses and Burros	
WHB-1	Avoid fencing that would restrict access to water. (RX, NF, ESR)	All

Notes: SUP - Wildfire suppression
NF - Non-fire fuel treatments
ESR - Emergency stabilization and rehabilitation
RX - Prescribed fire

APPENDIX F
Fire's Interaction with Resources

Fire's Interaction With Resources

To provide additional context in the analysis of impacts from fire management actions associated with both alternatives, a general description of fire's effects on each resource is presented below. These effects are present in the environment regardless of what alternative is selected. The alternative selected would increase or decrease these effects and that difference forms the basis of the analysis of impacts.

Fire's Interaction with Cultural Resources

The understanding of how fire affects cultural resources is necessary in order to analyze the impact of proposed management actions covered in Chapter 4. These interactions are context-dependent and vary by temperature and duration of exposure to heat. Generally, higher temperatures and/or longer duration of exposure to heat increase the potential for damage to cultural resources. Variables that affect temperature and duration include type of fuel, fuel load and distribution, fuel moisture, and soil type and moisture. Generally, fire does not affect buried cultural materials. Studies show that even a few centimeters of soil cover (10 cm) are sufficient to protect cultural materials (Oster n.d.). However, there are times when conditions do carry heat below the surface, with the potential to affect buried materials. These conditions include stumps, heavy duff, surface logs, and roots that smolder and burn. Fires that burn hot and fast through a site may have less of an effect on certain types of cultural materials than fires that smolder in the duff or than logs that burn for a period of time.

Prehistoric and historic resources potentially affected by fire may be inorganic (lithic, ceramics, cans, glass, rock art, etc.) or organic (basketry, wooden structures, dendroglyphs, etc.). Certain resources that are important for dating archaeological sites may also be affected. Generally, organic materials are more, at risk as they tend to burn or alter at lower temperatures than inorganic items.

Fire can affect chipped and groundstone tools through changes in morphology rather than in chemistry. Exposure to heat and rapid cooling may cause fracturing, potlidding, crazing, shattering, and changes in color and internal luster, which might reduce an artifact's ability to render information about the past. Deal (n.d.), Buenger (2003), Loyd et al. (2002), Shackley and Dillian (2002), and Waechter (n.d.) provide data concerning the effects of temperature on obsidian, various silicates (including chert), basalt, and sandstone used for groundstone. Generally, hotter temperatures and longer exposure to fire may affect lithic materials. When these materials are likely to be present, it may be necessary to take protective measures.

Different types of clays, inclusions, and manufacturing techniques lead to different effects among distinct ceramic types. Heat damage is not as significant a consideration for this artifact type as it is for others. Generally, structural damage does not occur until temperatures exceed the original firing temperature. The main type of damage noted is to the surface decoration or glaze (Andrews 2004; Rude and Jones n.d.). Pyne et al. (1996) suggests that when fires remain below 500° C and occur within 30 minutes (as is typical for prescribed burns), little damage to artifacts and resources even at shallow depths is likely to occur.

Inorganic historic artifacts are generally safe from fire, but some artifacts such as soldered cans may melt at temperatures as low as 137° to 177° C (Haecker n.d). Can morphology may be damaged and ceramic artifacts may crackle or spall in lower temperature fires. Other materials, such as machinery utilized in historic mining, are less susceptible. Inorganic structures constructed of sandstone, adobe, cement-mortared fieldstone, firebrick, cinder block, or cement aggregate are generally fire resistant. Fracturing and spalling may occur at 700° C (Buenger 2003). Wooden sub-structures (common in adobe structures) would be destroyed, possibly compromising the structure as a whole. Historic earthworks such as trails, roads, irrigation ditches, canals, etc. are less sensitive to fire.

Fire has the potential to damage rock art. Though there are no specific temperature guidelines for rock art, fire effects include soot smudging and discoloration from smoke, which obscure the rock art images;

degradation of the rock surface from spalling, exfoliation and increased weathering; changes in organic paints due to heat; and damage to rock varnish which may destroy its potential to date the art (Tratebas 2004; Kelly and McCarthy 2001).

Organic artifacts (e.g., basketry, digging sticks, clothing, textiles) and features (e.g., structures, bow-stave trees, wikiups, culturally modified trees, historic timber structures) made of or containing organics such as wood, leather and hide, or cordage would need protection or treatment before fire burns through a site containing such items. Bone and shell can sustain some degree of burning without complete destruction (Buenger 2003). Plant and animal residues may survive exposure to fire. Pollen may be destroyed at temperatures greater than 300° C (572° F), but animal proteins survive to 800° C (1472° F).

Determining temporal context is an important part of archaeology. Fire has the potential to adversely impact the dating potential of archaeological data. Fire is likely to destroy organic material such as bone, wood or charcoal that yield radiocarbon dates. Fire can modify or destroy obsidian hydration rinds, thus compromising obsidian hydration dates (Deal n.d.; Buenger 2003; Loyd et al. 2002; Shackley and Dillian 2002; Solomon 2002). Finally, temperatures that exceed original firing temperatures (generally 400° C) would destroy the potential for thermo-luminescence dating of ceramics (Rude and Jones n.d.).

Fire's Interaction with Special Status Species

Effects of fire on special status species and their habitat vary widely depending upon the size and intensity of the fire, fuel type, location, topography, season, and duration. High-severity wind and fire can destroy large areas of habitat and make recovery of those habitats a long process. Both low- and high-severity wildland fire can destroy important habitat, displace animal species, and inflict direct mortality. However, low-severity fires have greater potential to enhance and sustain a more natural and beneficial habitat.

Fire's Interactions with Surface Water Resources

Watersheds denuded by wildland fire are subject to accelerated soil erosion, reduced soil moisture, poor plant growth, and the loss of other ecosystem components. Wildland fire can also increase water temperature, alter stream channel morphology, affect floodplain functions and values and increase nutrient and sediment loads to downstream waters. Sediment from accelerated soil erosion and elevated levels of nitrogen and phosphorous from ash are common in water after wildland fires (NWCG 2001).

Wildland fires reduce vegetation cover, especially in the short-term, which intercepts precipitation before it hits the soil surface. The lack of vegetation cover on burned areas could allow precipitation to increase surface runoff, soil loss, and sediment input to surface waters. These sites could also have lower soil-water infiltration rates, which increase surface runoff and decrease soil moisture available for plants. The seasonal timing, size, duration, and severity of fires influence the magnitude of effects.

Burned watersheds generally respond to rainfall faster than unburned watersheds, potentially increasing the potential for flash flooding (Anderson et al. 1976). Water-repellent soils and cover loss could cause flood peaks to arrive faster, rise to higher levels, and entrain greater amounts of bedload and suspended sediments.

Wildland fire could have many effects on stream habitats, including changes in soil erosion, turbidity, sediment loads, and nutrient loads, as well as indirect effects such as changes in dissolved oxygen concentrations and algal growth. Sediment input could reduce the area suitable for spawning or smother fish eggs with fine materials. Removal of streamside vegetation increases water temperatures, streambank erosion, and the available streamside habitat (Monsen et al. 2004).

Fire's Interaction with Groundwater Resources

Fire can destroy accumulated forest floor material and vegetation, altering infiltration to groundwater by exposing soils to raindrop impact, or creating short-term water repellent conditions (MacDonald and Huffman 2004). Burned areas could also be more susceptible to erosion, delivering minerals to recharge areas. Effects of fire on groundwater, however, are generally not substantial due to the common depth of useable groundwater (tens to hundreds of feet) in relation to the depth of fire effects on soil and recharge (inches to feet).

Fire's Interaction with Wetlands and Riparian Zones

Historically, fires were an important component of the disturbance regime for watersheds and aquatic ecosystems. Fire in riparian communities would have been infrequent, and varied from small size (with highly mosaic burn patterns as a result of the higher moisture content generally present in riparian areas/species) to stand-replacing burns likely to have occurred only in extreme drought periods. Large fires supplied woody debris and triggered hydrologic events and debris flows that transported coarse substrates to stream channels. These processes may have provided the materials that maintained productive habitats for fish and other organisms (Swanson et al. 1990)

Fire suppression and control of wildland fires have altered the natural process of periodic burning and have resulted in fuel load buildups, increases in understory and brush, and increases in stand density (Wright 1990; Covington and Moore 1994). The re-sprouting ability of invasive species gives them a long-term ecological edge over native species in regard to recovery after fire. After the fires, tamarisk sprouts vigorously, while native riparian trees and shrubs generally do not.

Direct effects of fires include heating or abrupt changes in water chemistry (Minshall et al. 1989; McMahon and deCalista 1990; Rinne 1996; Beeny and Parker 1998). In the Stanislaus Complex of 1987 and other prescribed fires on the Stanislaus National Forest, Roberson noted that vigor of riparian species increased dramatically following the fires. This was partially attributed to lack of competition from adjacent vegetation (especially shading from dense, forested canopies). Indirect effects were changes in hydrologic regime, erosion, debris flows, woody debris loading, and changes to riparian cover (Swanson and Lienkaemper 1978; Brown 1989; Megahan 1991; Bozek and Young 1994).

Fires Interaction with Wilderness Study Areas

In many cases, fire is a natural part of the wilderness character of an area. Fire would have impacts to the resources within the eligible area (including vegetation, fish and wildlife, soils, and water, etc). Temporary disturbances may occur to resources and values, however, these effects would be short-term, while wilderness values are assessed on a long-term scale. Fire would likely have little or no effect on the eligibility of a WSA.

Fire's Interaction with Livestock Grazing

The burning of rangeland can result in an increase in the production of perennial grasses and grazing capacity. This is primarily accomplished by the removal of dense stands of sagebrush and other brush species (BLM 1991). However, a short-term loss of forage may occur following a fire event. A high severity fire has the potential to extend the time frame and decrease the capability for the generation of forage on rangelands through soil sterilization and loss of the native seed bank. High severity fires may also increase the potential for undesirable forage species to extend their distribution on a rangeland. The physical destruction of allotment improvements may also occur, restricting use of the allotment until they are rebuilt. The potential for this increases with higher severity fire events, due to increased heat or fire duration around both combustible and non-combustible allotment improvement infrastructure. Mortality of livestock can occur due

to the direct effects of fire. High severity fires moving quickly would have a greater chance at causing mortality.

Fire's Interaction with Woodland and Forestry

From a commodity standpoint, wildland fire often precludes the use of woodlands and forests for commercial products. Depending on the degree of consumption, burned wood may or may not be useful commercially. Burned trees, if only partially consumed, can still be used for firewood, lumber, pulp and some other fiber products. Wildland fire can completely consume all woodland and forest products making them unavailable for commercial uses. Even low severity fire would consume pine nuts and render some fiber unusable for certain products. In the long-term, frequent, low intensity fire would remove competing vegetation and lower branches of conifers, which would eventually produce a higher quality lumber product in the form of larger trees with fewer knots.

Fire's Interaction with Salt Desert Shrub Vegetation Type

Fire frequency has been estimated at 35 to more than 300 years and is historically classified as Fire Regime V. Most species of this type are not fire adapted and are considered climax the exception is threadleaf rabbitbrush (which is sensitive to competition when growing with other species but may dominate a post-burn site). Because rabbitbrush easily establishes from seed after fire, it is considered fire adaptable. Due to the risk of losing key ecosystem components and greatly increased fire regimes as invasive annual grasses dominate, salt desert shrub is typically classified as condition class 2 or condition class 3, depending on the relative departure from its historic fire regime (**Table 3.1**).

A lack of continuous cover (fuels) made fire rare to non-existent in salt desert shrub communities. Historically, these types did not burn often enough or in large enough patches to support dominance of fire-adapted plants. Most salt desert shrub species do not readily regenerate following fire. Further expansion of invasive species following fire is a major concern for salt desert shrub communities.

Fire's Interaction with Sagebrush Vegetation Type

Pre-settlement, stand-replacing fire frequencies for low-elevation sagebrush are estimated to vary from 60 to 110 years (Fire Regime II) (Whisenant 1990; Peters and Bunting 1994; Miller et al. 2001). Because of the high risk of losing key ecosystem components following fire due to cheatgrass invasion on the Salt Lake planning area, 100 percent of the sagebrush type is in a condition class 3.

Wyoming and basin big sagebrush do not sprout after fire, and low- to high-intensity fires kill most plants. Generally, the herbaceous understory composition does not determine the intensity and severity of wildland fires—sagebrush itself is the primary fire carrier. The high canopy cover associated with late, mature sagebrush stands likely facilitated historic stand-replacing fires. A sagebrush stand with a robust understory of native grasses and forbs would generally be replaced after fire with native perennial grassland, which would have eventually progressed through seral stages to sagebrush communities. Although sagebrush does not re-sprout with fire, it is a prolific seeder (a healthy, mature plant may produce 500,000 seeds) and if a seed source is present, re-establishment is quite rapid and dominance would occur within 20 years (Winward et al. 1997).

In the absence of fire, sagebrush canopy cover increases. According to Winward (2004) the maximum canopy cover for sagebrush is 30 percent; anytime canopy cover reaches more than 15 percent, the sagebrush individuals compete with each other. Because sagebrush is a relatively short-lived species, approximately 60 years, in the absence of fire there is no recruitment of younger individuals. Consequently, the stand has the tendency to become old and decadent.

Fire's Interaction with Pinyon and Juniper Woodlands

Most of the area where pinyon and juniper currently dominates was historically characterized by fires burning every 15 to 50 years (Kitchen 2004; Miller and Tausch 2001). Below 7,000 feet elevation, these woodlands are characterized by dense closed stands of pinyon and juniper, scarce understory, and high potential for cheatgrass invasion following fire, placing them in condition class 3. Additionally, prolonged drought has predisposed many pinyon pines to insect infestations, primarily the *Ips* spp beetle, whose larvae girdle the tree resulting in tree mortality. This has increased the fuel load. Above 7,000 feet, these woodlands are characterized by encroached pinyon and juniper, but less dense than condition class 3, and are at less risk of cheatgrass invasion following fire, so they are considered condition class 2.

Old-growth pinyon and juniper is estimated to be less than 10 percent of the current area classified as pinyon and juniper woodlands (Miller and Tausch 2001). Old-growth pinyon and juniper is often restricted to fire-safe habitats (e.g., steep, dissected, and rocky terrain, and in thin substrates along ridges), where they are considered climax. Fire frequency in these climax pinyon and juniper sites has been estimated at 200 to more than 300 years for old-growth pinyon and juniper (Romme et al. 2002; Goodrich and Barber 1999) and would be classified as Fire Regime V.

Because it is a non-sprouter and is thin-barked when young, fire was the major historical cause of destruction for young juniper trees. However, adult juniper trees in mature stands are difficult to burn since the understory is usually sparse (older trees succumb to fire when 60 percent of the crown is scorched). Pure juniper stands need 35 mph winds or greater to carry fire through the canopy. When they do ignite, these closed forests often support high intensity, stand-replacing crown fires covering large landscapes that can endanger firefighters and the general public (Keyes et al. 2003). It is generally agreed that fire was the most important natural disturbance that impacted the distribution of juniper and/or pinyon and juniper woodlands before the introduction of livestock in the 19th century (Miller and Rose 1999). Burkhardt and Tisdale (1976; Tirmenstein 1999) concluded that fire frequencies of 30 to 40 years would help keep juniper from expanding into mountain big sagebrush communities.

Fire's Interaction with Mountain Shrub Vegetation Type

Stand-replacing fire frequency ranges from 25 years to 100 years in mountain shrub (Gruell and Loope 1974), though return intervals may vary widely with changes in elevation, aspect, site moisture, and the associated forest or woodland type. Mountain shrubs are classified as Fire Regime I (e.g., Gambel oak), II (e.g., mixed mountain shrub or maple), and IV (e.g., mountain mahogany), depending on the dominant species and the site. The condition class also varies depending on the dominant species, and the understory. Mountain shrub communities at lower elevations (less than 6,500 feet) are classified as condition class 3 due to the high risk of cheatgrass invasion following fire. On the Salt Lake planning area, three percent of the mountain shrub vegetation type is in a condition class 1, whereas 97 percent is in a condition class 2. Some species, like oak, readily re-sprout after fire because they reproduce vegetatively. Others, like Ceanothus, have specialized seed, which enable it to readily invade burns (Knight 1994), while some are intolerant of fire, like curl-leaf mountain mahogany, mountain big sagebrush, and bitterbrush. This may cause a temporary shift in the species composition, however, most mountain shrub communities generally recover rapidly following wildland fire and are considered to be fire- tolerant.

Fire's Interaction with Mixed Conifer Vegetation Type

Fire frequencies in mixed conifer range from 100 to 300 years. These forests are characterized by a combination of understory and complete stand-replacement fire regimes (Arno 2000). Mixed conifer is classified as Fire Regime III or IV depending on the elevation and related dominant species. Fire Regime III would characterize conifer-shrub communities, occurring at lower elevations that have pure conifer stands. Due to the longer historic fire return intervals and well-functioning vegetation attributes, mixed conifer is

classified as condition class 1 when associated with Fire Regime IV, and condition class 2 when associated with Fire Regime III.

In recent years prolonged drought has predisposed species like Douglas-fir to insects (bark beetles) resulting in an increased fuel load. Dead woody fuels are accumulating, either standing and on the ground often in a haphazard manner; with the greatest fuel loadings occurring on the most productive sites, which are predominantly stand-replacement fire regimes. This fire regime of mixed severity often results in a mosaic pattern of stand structure and fuels. Past stand burn mosaics tend to increase the probability that subsequent fires would also burn in a mixed pattern (Arno 2000). When fires do occur, they tend to be intense and may sterilize the ground, with some 30-year-old fire scars showing very little vegetation returning.

Fire's Interaction with Fisheries and Wildlife Resources

Effects of fire on special status species and their habitat vary widely depending upon the size and intensity of the fire, fuel type, location, topography, season, and duration. High-severity wind and fire can destroy large areas of habitat and make recovery of those habitats a long process. Both low- and high-severity wildland fire can destroy important habitat, displace animal species, and inflict direct mortality. However, low-severity fires have greater potential to enhance and sustain a more natural and beneficial habitat.

Fire's Interaction with Soil

Fires affect soils primarily by consuming live or dead vegetation cover, litter, and organic soil layers and the resulting loss of soil stabilizing organic material such as root structure. Fire may also alter soil chemical properties, post-fire soil temperatures, microorganism populations and their activity rates, erosion rates, increase nutrient availability, sterilize soil, and increase soil water repellency (NWCG 2001; Centers for Water and Wildland Resources 1996). The degree of short-term effect on these soil characteristics depends on amount of vegetation, and thickness and density of litter and organic layers. Soil texture and type, soil moisture at the time of burning, and depth and duration of heat penetration into soil horizons are also critical factors (NWCG 2001). Soil water repellency (hydrophobicity) from severe fire may substantially increase runoff and erosion but repellency has not been found to persist for more than one year after a wildland fire (MacDonald and Huffman 2004.)

The single most important factor in soil health (topsoil and nutrient loss) is the timing of vegetation recovery with the severity of precipitation rates. The potential for post-fire erosion also depends on the soil type in the area of the burn, the amount of residual vegetation and organic matter, the rate and amount of vegetation recovery, and slope. If post-fire rains are relatively gentle, some nutrients released by a fire may be reabsorbed; however, these nutrients are generally lost during severe, erosive rainfall.

Soil microorganisms (biological crusts) may be affected by heating from fire, as well as surface disturbances that compact or disaggregate these features. Disturbance of biological crusts can increase the potential for both water and wind erosion.

Fire's Interaction with Recreation

Fires can partially or completely destroy developed facilities. Fires can temporarily change the landscape in a manner which degrades visual quality and recreation opportunities and experiences. The landscape may be blackened, or smoke could limit visibility. During periods of high fire danger and wildland fire activity, recreation use may be restricted or prohibited on large areas of public lands to protect public safety.

Fire's Interaction with Socioeconomics

The effects of fire in general to socioeconomic resources may include loss of infrastructure and other capital improvements (structures), particularly in the WUI; loss of potential income from the harvesting of forest products; short-term displacement of game animals resulting in decreased animal harvest; temporary loss of use of grazing allotments; permanent loss of range improvements such as water troughs, fences, and corrals; and increased costs to feed livestock and replace range improvements. The economic impact of fire for grazing would likely be negative in the short-term but can have positive economic returns due to a decrease in woody plant materials and an increase in favorable forage species (particularly if seeding occurs). Other examples of ways that fire interacts with local socioeconomic conditions may include temporary or permanent displacement from places of employment or residence, loss of personal safety and security, loss of property or reduction in property value, altered transportation patterns, health impacts due to impaired air quality, reduction in scenic quality, impacts to tourism, and direct costs to agencies tasked with suppression (which may be realized as income to firefighters and related support personnel).

Fire's Interaction with Wilderness Characteristics

In many cases, fire is a natural part of the wilderness character of an area. Fire would have impacts to the resources within the eligible area (including vegetation, fish and wildlife, soils and water, etc). Temporary disturbances may occur to resources and values; however these effects would be short-term while wilderness values are assessed on a long-term scale. Fire would likely have little or no effect on the wilderness characteristics of an area.

APPENDIX G
Federally Listed, Candidate, and Petitioned Species within the Planning Area

Federally Listed, Candidate, and Petitioned Species within the Planning Area

Common Name[a]	Scientific Name	Federal Status[b]	Vegetation Community (Substrate type identified for flowering plants only)
Ute ladies'-tresses (*H*)	*Spiranthes diluvialis*	Threatened	Riparian/Wetland (hanging gardens)
Goose Creek milk-vetch	*Astragalus anserinus*	Petitioned	Salt Desert Shrub, Pinyon and Juniper Woodlands, Sagebrush (igneous, sandy)
Bald eagle (*Br*)	*Haliaeetus leucocephalus*	Threatened	Sagebrush, Mixed Conifer, Riparian / Wetland
Western yellow-billed cuckoo	*Coccyzus americanus*	Candidate	Riparian/Wetland
Black-footed ferret (*H, Exp, Un*)	*Mustela nigripes*	Endangered, 10(j)	Sagebrush, Grassland
Canada lynx (*H*)	*Lynx canadensis*	Threatened	Mixed Conifer
White-tailed prairie dog	*Cynomys leucurus*	Petitioned	Sagebrush
Pygmy rabbit	*Brachylagus idahoensis*	Petitioned	Sagebrush
June Sucker* (*I*)	*Chasmistes liorus*	Endangered	Water
Lohontan cutthroat trout	*Oncorhynchus clarki henshawi*	Threatened	Water
Fat-whorled pondsnail	*Stagnicola bonnevillensis*	Candidate	Riparian/Wetland

[a] Definitions for notations:

Species with an asterisk (*) have designated critical habitat. Species with a double asterisk (**) have proposed critical habitat.

Br—Species known to nest or breed within the planning area.

H—Species or populations existed in historical locations (i.e., the current range or number of individuals or populations has decreased when compared to historical standards). For extirpated species, all management areas are considered historical.

Exp—Management areas contain designated use areas for experimental, nonessential populations designated under Section 10(j) of the ESA, as amended.

I—Management areas contain introduced, refugia populations of the species.

Un—Management areas contain unconfirmed historical locations of the species.

[b] Definitions for species status:

Endangered species are those species or distinct populations listed by USFWS that have a probability of worldwide extinction.

Threatened species are those species or distinct populations listed by USFWS that are threatened with becoming endangered.

Candidate and petitioned species have no legal protection under the ESA, as amended. However, USFWS has sufficient information on biological vulnerability and threats to candidate species that they are under active consideration by USFWS for federal listing. For petitioned species, outside entities have submitted petitions to USFWS to consider these species for federal listing. Candidate or petitioned species could be proposed or listed during the life of the Proposed Action Alternative for this project.

Species designated as "10(j)" are considered by the USFWS to be "experimental and non-essential populations" within designated use areas in Utah, as provided by Section 10(j) of the ESA, as amended. This designation provides greater management flexibility. For BLM, 10(j) populations of federally listed species are equivalent to a "proposed" status.

Species designated as "extirpated" are federally endangered, threatened, or candidate species that are considered by USFWS to no longer occur in Utah.

APPENDIX H
BLM Sensitive Species within the Planning Area

BLM Sensitive Species within the Planning Area

Common Name	Scientific Name	Federal Status[b]	Vegetation Community (substrate type identified for flowering plants only)
Grouse Creek arabis	*Arabis falcatoria*	SPS	Grassland (chip rock)
Pohl's milk-vetch	*Astragalus lentiginosus var. pohlii*	SPS	Salt Desert Shrub, Sagebrush (sandy)
Small spring parsley	*Cymopterus acaulis var. parvus*	SPS	Salt Desert Shrub, Pinyon and Juniper Woodland, Sagebrush (sandy)
Kass rockcress	*Draba kassii*	SPS	Pinyon and Juniper Woodland, Mountain Shrub, Mixed Conifer (quartzite)
Deep Creek stickseed	*Hackelia ibapensis*	SPS	Mountain Shrub, Mixed Conifer (granitic, quartzite)
Idaho penstemon	*Penstemon idahoensis*	SPS	Pinyon and Juniper Woodland, Sagebrush (limestone, shale)
Cottam cinquefoil	*Potentilla cottamii*	SPS	Mixed Conifer (quartzite)
Rock violet	*Viola lithion*	SPS	Mixed Conifer, Aspen (limestone, quartzite)
Northern goshawk	*Accipiter gentiles*	CA	Mixed Conifer, Riparian and Wetland
Grasshopper sparrow	*Ammodramus savannarum*	WSC	Grassland
Short-eared owl	*Asio flammeus*	WSC	Grassland
Burrowing owl	*Athene cunicularia*	WSC	Grassland
Ferruginous hawk	*Buteo regalis*	WSC	Sagebrush, Grassland
Black swift	*Cypseloides niger*	WSC	Mountain Shrub, Mixed Conifer, Riparian and Wetland, Aspen
Bobolink	*Dolichonyx oryzivorus*	WSC	Riparian and Wetland
Lewis's woodpecker	*Melanerpes lewis*	WSC	Pinyon and Juniper Woodland, Mountain Shrub, Mixed Conifer, Ponderosa Pine, Riparian and Wetland
Long-billed curlew	*Numenius americanus*	WSC	Grassland
American white pelican	*Pelecanus erythrorhynchos*	WSC	Riparian and Wetland
Three-toed woodpecker	*Picoides tridactylus*	WSC	Mixed Conifer, Aspen
Greater sage grouse	*Centrocercus urophasianus*	WSC	Sagebrush
Sharp-tailed grouse	*Tympanuchus phasianellus*	WSC	Grassland
Preble's shrew	*Sorex preblei*	WSC	Riparian and Wetland
Townsend's big-eared bat	*Corynorhinus townsendii*	WSC	Mountain Shrub, Mixed Conifer
Spotted bat	*Euderma maculatum*	WSC	Salt Desert Shrub, Mountain Shrub, Mixed Conifer, Ponderosa Pine

Common Name	Scientific Name	Federal Status[b]	Vegetation Community (substrate type identified for flowering plants only)
Western red bat	*Lasiurus blossevillii*	WSC	Mixed Conifer, Riparian and Wetland
Fringed myotis	*Myotis thysanodes*	WSC	Salt Desert Shrub, Pinyon and Juniper Woodland, Mixed Conifer
Dark kangaroo mouse	*Microdipodops megacephalus*	WSC	Sagebrush
Kit fox	*Vulpes macrotis*	WSC	Salt Desert Shrub
Bonneville cutthroat trout	*Oncorhynchus clarki utah*	CA	Water
Colorado River cutthroat trout	*Oncorhynchus clarki pleuriticus*	CA	Water
Least chub	*Iotichthys phlegethontis*	CA	Water
Leatherside chub	*Gila copei*	WSC	Water
Roundtail chub	*Gila robusta*	CA	Water
Bluehead sucker	*Catostomus discobolus*	CA	Water
Flannelmouth sucker	*Catostomus latipinnis*	CA	Water
Yellowstone cutthroat trout	*Oncorhynchus clarki bouvieri*	WSC	Water
Eureka mountainsnail	*Oreohelix eurekensis*	WSC	Pinyon and Juniper Woodlands, Sagebrush Grassland, Mountain Shrub Mixed Conifer, Aspen
Lyrate mountainsnail	*Oreohelix haydeni*	WSC	Sagebrush, Mountain Shrub
Utah physa	*Physella utahensis*	WSC	Riparian and Wetland, Water
Bear Lake springsnail	*Pyrgulopsis pilsbryana*	WSC	Riparian and Wetland, Water
Southern Bonneville pyrg	*Pyrgulopsis transversa*	WSC	Riparian and Wetland, Water
Northwest Bonneville pyrg	*Pyrgulopsis variegata*	WSC	Riparian and Wetland, Water
California floater	*Anodonta californiensis*	WSC	Riparian and Wetland, Water
Western pearlshell	*Margaritifera falcate*	WSC	Riparian and Wetland, Water
Boreal (= Western) toad	*Bufo boreas*	WSC	Mixed Conifer, Riparian and Wetland
Smooth greensnake	*Opheodrys vernalis*	WSC	Sagebrush, Riparian and Wetland

[a] Species already represented as federally listed, candidate, or petitioned species are not repeated here. Sources of information: Utah Sensitive Species List, December 18, 2003 (UDEQ 2003); Draft BLM Sensitive Plant Species List for Utah (BLM 2002).

[b] BLM sensitive species status designations are Conservation Agreement, BLM Wildlife Species of Concern, and BLM Sensitive Plant Species. CA species receive special management under a CA to preclude the need for listing. CA are voluntary cooperative plans among resource agencies that identify threats to a species and implement conservation measures to proactively conserve and protect species in decline.

APPENDIX I
Biological Opinion Terms and Conditions

BIOLOGICAL OPINION TERMS AND CONDITIONS ONLY APPLY TO THOSE SPECIES AND/OR HABITATS WITHIN THE SALT LAKE FIELD OFFICE.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act, as amended, prohibits take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering (50 CFR § 17.3). "Harass" is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3).

No exemption from Section 9 of the Act is granted in this biological opinion. BLM's implementation of the Land Use Plan Amendment and Five Fire Management Plans is likely to adversely affect listed species. The likelihood of incidental take, and the identification of reasonable and prudent measures and terms and conditions to minimize such take, will be addressed in project level, and possibly programmatic level consultations. Any incidental take and measures to reduce such take cannot be effectively identified at the level of proposed action because of the uncertainty of wildland fire, broad geographic scope, and the lack of site specific information. Rather, incidental take and reasonable and prudent measures may be identified adequately through subsequent actions subject to section 7 consultations at the project and/or programmatic scale.

Even though actual take levels are unquantifiable, take will occur through harm and harassment. Therefore, we are providing the following Reasonable and Prudent Measures (RPMs) and Terms and Conditions to minimize overall take. Implementation of these RPMs and Terms and Conditions during project planning will also expedite site-specific section 7 consultation.

REASONABLE AND PRUDENT MEASURES

The U.S. Fish and Wildlife Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of black-footed ferret, Canada lynx, Utah prairie dog, Southwestern willow flycatcher, California condor, bald eagle, Mexican spotted owl, desert tortoise, Colorado pikeminnow, razorback sucker, humpback chub, bonytail, Virgin River chub, woundfin, Lahontan cutthroat trout, dwarf bear-poppy, Shivwits milk-vetch, Holmgren milk-vetch, Kodachrome bladderpod, San Rafael cactus, Siler pincushion cactus, shrubby reed-mustard, Uinta Basin hookless cactus, Ute ladies'-tresses, and last chance townsendia:

1. The Bureau of Land Management shall implement measures to minimize mortality or injury of the black-footed ferret, Canada lynx, Utah prairie dog, Southwestern willow flycatcher, California condor, bald eagle, Mexican spotted owl, desert tortoise, Colorado pikeminnow, razorback sucker, humpback chub, bonytail, Virgin River chub, woundfin, Lahontan cutthroat trout, dwarf bear-poppy, Shivwits milk-vetch, Holmgren milk-vetch, Kodachrome bladderpod, San Rafael cactus, Siler pincushion cactus, shrubby reed-mustard, Uinta Basin hookless cactus, Ute ladies'-tresses, and last chance townsendia due to proposed project activities; without placing firefighter personnel at risk.

2. The Bureau of Land Management shall implement measures to minimize harm to the black-footed ferret, Canada lynx, Utah prairie dog, Southwestern willow flycatcher, California condor, bald eagle,

Mexican spotted owl, desert tortoise, Colorado pikeminnow, razorback sucker, humpback chub, bonytail, Virgin River chub, woundfin, Lahontan cutthroat trout, dwarf bear-poppy, Shivwits milk-vetch, Holmgren milk-vetch, Kodachrome bladderpod, San Rafael cactus, Siler pincushion cactus, shrubby reed-mustard, Uinta Basin hookless cactus, Ute ladies'-tresses, and last chance townsendia through destruction of their suitable or designated critical habitats; without placing firefighter personnel at risk.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Bureau of Land Management must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary. The following terms and conditions apply to all species covered under this biological opinion, and are to be implemented in addition to the Applicant Committed Measures described in the Proposed Action:

General Terms and Conditions

1. To implement Reasonable and Prudent Measure 1:
    a. Before the beginning of each fire season, a threatened and endangered species education program will be presented to all personnel anticipated to be within federally listed species habitats during suppression activities. This program will contain information concerning the biology and distribution of listed species throughout the Fire Management Plan Planning Area, their legal status, fire suppression goals and restrictions within suitable and critical habitat. Following training, each individual will sign a completion sheet to be placed on file at the local BLM office.
    b. All project employees (including fire fighting personnel) shall be informed as to the definition of "take", the potential penalties (up to $200,000 in fines and one year in prison) for taking a species listed under the Endangered Species Act, and the terms and conditions provided in this biological opinion.
    c. A qualified Resource Advisor will be assigned to each wildfire that occurs in or threatens listed species habitat. The Resource Advisor's role is help define goals and objectives for fire suppression efforts and informs the Incident Commander (IC) of any restrictions, but does not get involved in specific suppression tactics. Resource advisors shall oversee fire suppression and suppression rehabilitation activities; to ensure protective measures endorsed by the Incident Commander are implemented.
    d. For pre-planned projects, the Authorized Officer shall designate an individual as a contact representative who will be responsible for overseeing compliance with the Applicant Committed Measures and terms and conditions contained in this biological opinion, and providing coordination with the U.S. Fish & Wildlife Service. The representative will have the authority to halt activities which may be in violation of these conditions, unless human health and safety or structures are at risk, in which case the Incident Commander overseeing the wildfire suppression actions will have the final decision making authority.
    e. Project related personnel shall not be permitted to have firearms or pets in their possession while on the project site. The rules on firearms and pets will be explained to all personnel involved with the project.
    f. If available, maps shall be provided to local dispatch centers showing general locations of listed species. Local BLM or UDWR biologists shall be consulted for

specific locations if fires occur within or near the general locations delineated on the map.

g. Conduct pre- and post- monitoring of the response to the treatments by federally listed species.

2. To implement Reasonable and Prudent Measure 2:
   a. Fingers or patches of unburned vegetation within burned areas shall not be burned out as a fire suppression measure unless required for safety concerns.
   b. Emergency Stabilization and Rehabilitation efforts must focus on areas in the spread of non-native species particularly within suitable habitat for federally listed species. The specific seed mix for use within suitable habitat for federally listed and sensitive species will be determined through coordination and section 7 consultation with the U.S. Fish and Wildlife Service.
   c. Recovery of vegetation shall be monitored, including establishment and monitoring of paired plots, inside and outside of the burned area unless the BLM and the Service concur that monitoring is not required.
   d. Site-specific projects under the Land Use Plan Amendment and Fire Management Plans shall specifically recognize the primary constituent elements necessary for functional critical habitats to ensure consistent application of measures to maintain these features in all implementation activities.
   e. The effectiveness of suppression activities and threatened and endangered species conservation measures shall be evaluated after a fire in coordination with the U.S. Fish and Wildlife Service. Procedures shall be revised as needed.
   f. Conduct pre- and post-monitoring of threatened or endangered species' habitat conditions.
   g. Temporarily close off highway vehicle (OHV) trails after a fire event until vegetation and soils recover.
   h. Obscure decommissioned trails and roads and illegal OHV trails after a fire event to prevent re-opening.

Black-Footed Ferret and Utah Prairie Dog

1. To implement Reasonable and Prudent Measures 1 and 2:
   a. Wildfires will be suppressed before they reach a prairie dog colony or after they exit a colony. Active suppression efforts will not occur within a colony unless human health and safety or structures are at risk.
   b. Only hand lines will be authorized within colonies.
   c. Normally, only water shall be used on fires that occur within prairie dog colonies[1]. If the fire Incident Commander decides that the situation requires use of chemical retardants in order to protect life and property, they may be used. The chemical composition will be supplied to the U.S. Fish and Wildlife Service during formal consultation.

[1] "Prairie dog colony" refers to any occupied Utah prairie dog colony or any prairie dog colony within the range of the black footed ferret.

d. All vehicles shall stay on existing roads within colonies, except as stated in (e). Storage of equipment and materials shall not occur within ¼ mile of colonies. Vehicle maintenance shall not occur within these areas.
e. If the situation would require vehicles to travel cross country within prairie dog colonies, this activity shall be cleared by an on-site biologist prior to occurring. Vehicles shall not exceed a speed of 10 miles per hour (cross country) in occupied Utah prairie dog colonies unless a higher speed is determined to be prudent for safety reasons.
f. Within colonies, precautions shall be taken to ensure that contamination of the site by fuels, motor oils, grease, etc. does not occur and that such materials are contained and properly disposed of off-site. Inadvertent spills of petroleum based or other toxic materials shall be cleaned up and removed immediately.
g. Camps associated with fire suppression activities shall be situated outside suitable habitat.
h. If a dead or injured Utah prairie dog is located, initial notification must be made to the Service's Division of Law Enforcement, Cedar City, Utah at telephone 435-865-0861 or to the Cedar City office of the Utah Division of Wildlife Resources at telephone number 435-865-6100. Instruction for proper handling and disposition of such specimens will be issued by the Division of Law Enforcement. Care must be taken in handling sick or injured animals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state.
i. For the black-footed ferret, avoidance and minimization measures that should be followed are included within the *Cooperative Plan for the Reintroduction and Management of Black-Footed Ferrets in Coyote Basin, Uintah County, Utah* published by the Utah Division of Wildlife Resources in September, 1996. These measures may be updated based on the best available scientific data as it becomes available.

Canada Lynx

1. To implement Reasonable and Prudent Measures 1 and 2:
    a. The Lynx Conservation Assessment and Strategy (LCAS) shall be incorporated into project plans as appropriate, and any applicable standards, guidelines, and objectives specifically related to linkage habitat would be followed during implementation of fire management activities.

Southwestern Willow Flycatcher

1. To implement the Reasonable and Prudent Measure 1:
    a. Prior to planned project activities, action areas will be surveyed according to U.S. Fish and Wildlife Service protocol.
    b. Except where fires are active in occupied habitat, minimize unnecessary low-level helicopter flights during the breeding season (April 1 – September 30). If safety allows, approach bucket dip sites at a 90-degree direction to rivers to minimize flight time over the river corridor and occupied riparian habitats. Locate landing sites for helicopters at least ¼ mile from occupied flycatcher habitat unless human safety or property dictates otherwise.
    c. Minimize use of chainsaws or bulldozers to construct fire lines through occupied or suitable habitat except where necessary to reduce the overall acreage of occupied habitat or other important habitat areas that would otherwise be burned.

d. Implement activities to reduce hazardous fuels or improve riparian habitats (prescribed burning or vegetation treatments) within occupied or un-surveyed suitable habitat for southwestern willow flycatchers only during the non-breeding season (October 1 to March 31).

2. To implement Reasonable and Prudent Measure 2:
   a. Riparian fuel reduction actions shall be considered as experimental, and initially conducted only in unoccupied habitats until the success and ramifications are better understood. Efficacy of these actions as a fire management tool, and effects on bird habitat quality, shall be tested in a scientifically explicit, controlled fashion (Appendix L in U.S. Fish and Wildlife Service 2002).
   b. In occupied or suitable flycatcher habitat, creation of fire breaks might render the habitat unsuitable (Appendix L in U.S. Fish and Wildlife Service 2002). Therefore, fire breaks shall first be conducted only in unoccupied sites, outside of proposed critical habitat, or within the following situations, as long as human safety and property allows:
      i. Along grass-edged roadways;
      ii. Where large areas of fire-prone vegetation, unsuitable for flycatcher breeding, separate a breeding site from potential ignition sources or high frequency fire areas; and
      iii. Between agricultural "burn areas" and flycatcher sites to prevent brush-pile fires from spreading into breeding sites (Appendix L in U.S. Fish and Wildlife Service 2002).
   c. Controlled burns shall be avoided in occupied habitat and considered only as experimental management techniques if dealing with suitable unoccupied habitat (Appendix L in U.S. Fish and Wildlife Service 2002).
   d. Fires in occupied habitat and adjacent buffer zones shall be rapidly suppressed.

California Condor and Bald Eagle

1. To implement the Reasonable and Prudent Measure 1:
   a. If California condors or bald eagles are found inhabiting (nesting) within the action area, a buffer of 1 mile surrounding the nesting area will be designated as non-treatment zones (Romin and Muck 2002).
   b. Open water sources such as "pumpkin" inflatable water storage tanks will be covered when not in use.

Mexican Spotted Owl

1. To implement Reasonable and Prudent Measure 1:
   a. Pre-planned fuels reduction projects within Mexican spotted owl primary activity centers (PAC) shall be designed to enhance habitat requirements for the Mexican spotted owl as well as for the valuable prey species they rely upon. Any project within a PAC requires additional section 7 consultation.
2. To implement Reasonable and Prudent Measure 2:
   a. Fire suppression shall be considered for wildfires in PACs.

Desert Tortoise

1. To implement Reasonable and Prudent Measure 1:
    a. Campsites, aircraft landing and fueling areas, staging areas, and helicopter dip sites shall either be located outside of desert tortoise habitat or cleared by the Resource Advisor or tortoise biologist.
    b. Hand crews shall be used to build and defend fire lines. Engines can be used for support from roads. Wherever practical, fire engines must remain on roads and lay fire hose only along hand lines.
    c. The Resource Advisor, tortoise biologist, or biological monitor (someone who is either qualified with a biological background or has been trained by the Resource Advisor) ensures that tortoises, burrows, and shelter sites are protected or avoided by walking in front of engines, tracked vehicles, or other fire fighting related vehicles within the critical habitat.
    d. On-road travel shall be restricted to speeds (25 mph) that allow drivers to distinguish obstacles such as a rocks and tortoises.
    e. Firefighters shall note locations and condition of desert tortoises and carcasses, but must not attempt to touch or move them unless the animal is in immediate danger from fire or is on a road that is receiving traffic use. Firefighters shall be encouraged to provide notes to tortoise Resource Advisor or tortoise biologist.
    f. Garbage and trash must not be left in project vicinity.
2. To implement Reasonable and Prudent Measure 2:
    a. Wildfires that occur in tortoise habitats shall be suppressed as soon as possible due to the habitat changes associated with wildfire that alter food availability and the availability of plants for protection from thermal extremes and predators.
    b. Tracked vehicles have long-lasting impacts on desert soils and vegetation, and therefore their use shall be restricted to improving roads or constructing lines where a short distance of line might save a large area from fire.
    c. Rehabilitation of suppression related actions must be coordinated with the Resource Advisor to avoid further impacts. For example, the rehabilitation of lines created on the sensitive desert soils may cause more damage than the initial suppression actions. Obliterate vehicle tracks at the point they leave existing roads to prevent those tracks from becoming future trails and roads.

Lahontan Cutthroat Trout

To implement Reasonable and Prudent Measures 1 and 2, we recommend full implementation of the Memorandum of Understanding (MOU) between the BLM, Service, Utah Division of Wildlife Resources, and Utah Division of Forestry, Fire and State Lands. The purpose of this MOU is to provide a framework of cooperation for interagency fire management between the Bureau of Land Management (Salt Lake and Elko Field Offices), U. S. Fish and Wildlife Service (Region 1 and Region 6), and the Utah Department of Natural Resources (Division of Wildlife Resources and Division of Forestry, Fire, and State Lands), within the Bettridge and Morrison Creek drainages of the Pilot Mountains. This MOU contains Standard Operating Procedures to be used for the protection of the threatened Lahontan cutthroat trout and their habitat during fire suppression and rehabilitation activities in these two drainages. The Standard Operating Procedures developed through the MOU are listed below.

1. Standard Operating Procedures for Suppression Activities:
    a. Avoid the application of retardant or foam within 600 feet of the stream channel or waterway. With the exception of restricting the use of retardants and foams to 600 feet from stream channels or waterways, aerial application and use of retardants and foams will be consistent with national policy guidelines established by the National Office of Fire and Aviation, as amended.
        i. The exceptions to this procedure are:
            (1) When alternative line construction tactics are not available due to terrain constraints, congested area, life and property concerns or lack of ground personnel, it is acceptable to anchor the foam or retardant application to the waterway. When anchoring a retardant or foam line to a waterway, use the most accurate method of delivery in order to minimize placement of retardant or foam in the waterway (e.g., a helicopter rather than a heavy air tanker).
            (2) Deviations from these guidelines are acceptable when life or property is threatened and the use of retardant or foam can be reasonably expected to alleviate the threat.
            (3) When potential damage to natural resources outweighs possible loss of aquatic life, the unit administrator may approve a deviation from these guidelines. This determination will be made on a case-by-case basis by the Field Manager or the designated Field Manager representative in consultation with the Fire Management Officer, Incident Commander, Resource Advisor, and BLM Field Office Fisheries Biologist through development of the Wildfire Situation Analysis.
    b. Do not draft fill engines that have surfactant foam mixes in tanks, directly from the stream channel.
    c. A containment barrier will be constructed around all pumps and fuel containers utilized within 600 feet of the stream channel to prevent petroleum products from entering the stream. The containment barrier will be of sufficient size to contain all fuel being stored or used on site.
    d. Do not dump engines filled with surfactant foam mixes within 600 feet of the stream channel.
    e. Do not conduct retardant mixing operations within 600 feet of the stream channel.
    f. Stream flow will not be impounded or diverted by mechanical or other means in order to facilitate extraction of water from the stream for fire suppression efforts.
    g. The intake end of the draft hose will be screened to prevent entrainment of fish species. Screen opening size will be a maximum of 3/16 inch.
    h. Before each fire assignment in the Elko and Salt Lake Districts, all fire suppression equipment utilized to extract water from stream or spring sources (i.e. helicopter buckets, draft hoses and screens) will be thoroughly rinsed to remove mud and debris and disinfected with a chlorine solution (one part bleach to 32 parts water, or stronger). Rinsing equipment with disinfectant solutions will not occur within 600 feet of natural water sources (streams or springs).
    i. Only water sources identified as specified dip sites will be used to control and/or contain fire with the Bettridge and Morrison Creek drainages. Water may be obtained from the pond on the TL Bar Ranch (Donner Springs). The coordinates of this dip site are: N 41 01 22.6 X W 113 58 04.3.
    j. Water extraction from streams currently occupied by LCT (including beaver ponds) is restricted.

k. Fire control lines will not cross or terminate at the stream channel. Control lines will terminate at the edge of the riparian zone at a location determined appropriate to meet fire suppression objectives based on fire behavior, vegetation/fuel types, and fire fighter safety.

l. Access roads and/or fords will not be constructed across the stream channel.

m. New roads or mechanical fire control lines will not be constructed and existing roads will not be improved within 600 feet of the stream channel unless authorized by the Field Manager or the designated Field Manager representative.

2. Standard Operating Procedures for Rehabilitation Measures:

a. An assessment of the impacts of fire and fire suppression activities to LCT habitat will be completed by an interdisciplinary team of resource specialists, including the Elko and Salt Lake BLM Field Office Fisheries Biologists and Hydrologists, representatives from the Service, representatives from the Utah Division of Wildlife Resources, and representatives from Utah Division of Forestry, Fire and State Lands. Based on this assessment, appropriate rehabilitation measures will be identified consistent with Departmental Emergency Stabilization and Rehabilitation Handbook guidance, including but not limited to some or all of the following:

i. Where determined necessary by the interdisciplinary review team, a post-fire contingency plan for immediate and effective protection, rescue, and rehabilitation of, and minimization of risk of injury to LCT populations and their habitat will be created.

ii. Close the affected watershed and/or stream channel to livestock grazing for two or more growing seasons to allow for recovery of riparian vegetation. The appropriate length of time for closure to livestock grazing will be determined on a site specific basis based on resource data, scientific principles, and experience. Site specific monitoring will determine when resource objectives have been achieved on specific burned areas. Site specific vegetative recovery objectives will be identified by the interdisciplinary review team and included in the Notice of Closure to Livestock Grazing issued in accordance with 43 CFR 4110.3-3.

iii. Reconstruct damaged fences and/or construct new fences to ensure protection of the stream channel from grazing. In Wilderness Study Areas, fence construction and/or reconstruction will be in accordance with Interim Management Policy Guidelines.

iv. Monitor stream and riparian habitats to allow for comparison of post-fire impacts to existing baseline information.

v. Where determined necessary by the interdisciplinary review team, install appropriate erosion control structures (i.e. erosion matting and/or straw bale structures, straw wattles, etc.) to mitigate overland flow effects to the stream channel.

vi. Where determined necessary by the interdisciplinary review team, reseed and/or replant riparian/wetland areas with native plant species to facilitate re-establishment of perennial vegetation, minimize potential channel erosion, and allow for recovery of riparian functionality.

vii. Rehabilitate improved roads located within 600 feet of the stream channel as determined necessary to mitigate potential sedimentation into the stream channel.

viii. Implement appropriate integrated noxious weed control measures where determined necessary by the interdisciplinary review team and/or where determined appropriate through post-fire monitoring.

ix. Where determined necessary by the interdisciplinary review team, initiate temporary road closures for at least one year to protect and stabilize burned areas

and associated watersheds. An interdisciplinary assessment will be conducted after the first year to determine if road closures are still needed.

Threatened or Endangered Plants

1. To implement Reasonable and Prudent Measure 1:
    a. Do not allow wildland fire use or prescribed fire activities within suitable, occupied habitat.
    b. When feasible (human life or property are not at risk) fire breaks shall be constructed down slope of plants and populations; if fire breaks must be sited upslope, buffers of 100 feet minimum between surface disturbances and plants and populations will be incorporated.
2. To implement Reasonable and Prudent Measure 2:
    a. Do not allow wildland fire use or prescribed fire activities within suitable, occupied habitat.
    b. For pre-planned projects within known or potential habitat, site inventories shall be conducted to determine habitat suitability prior to initiation of project activities, at a time when the plant can be detected, and during appropriate flowering periods, and will include, but not be limited to, plant species lists and habitat characteristics.
    c. For riparian/wetland-associated species, e.g. Ute ladies-tresses, avoid loss or disturbance of riparian habitats:
        i. Ensure that water extraction or disposal practices do not result in change of hydrologic regime.
    d. Limit disturbances to and within suitable habitat by staying on designated routes.
    e. Limit new access routes created by the project.
    f. Place signing to limit ATV travel in sensitive areas.
    g. All disturbed areas will be re-vegetated with native species comprised of species indigenous to the area.

Shivwits Milk-Vetch

1. To implement Reasonable and Prudent Measures 1 and 2:
    a. During wildland fire events, do not suppress wildland fire within the extremely sensitive soils (Chinle formation) unless another threatened or endangered species (i.e. desert tortoise), or life or property are at risk.
    b. Do not seed within the Chinle formation.
    c. Do not rehabilitate areas impacted by suppression activities, such as hand lines, areas that may have been trampled, or areas that may have been impacted by fire retardant drops.
    d. The effects of any fire or suppression activity within suitable habitat for the Shivwits milk-vetch will be monitored as these measures have not been tested. These measures are based on the sensitive nature of the soils that support the plant. Up-dating and fine-tuning methods to implement during wildland fire events and post emergency stabilization and rehabilitation activities shall rely upon adaptive management techniques.

Siler Pincushion Cactus

1. To implement Reasonable and Prudent Measures 1 and 2:

a. Follow and implement the restrictions to pesticide use within suitable Siler pincushion cactus habitat developed by the Environmental Protection Agency (EPA). These limitations were excerpted from the EPA's Pesticides: Endangered Species Protection Program (http://www.epa.gov/oppfead1/endanger/arizona/cocon.htm#brady):
   i. If the active ingredient is 2, 4-D (all forms), ATRAZINE, CLOPYRALID, DICAMBA (all forms), DICHLORPROP (2, 4-DP), HEXAZINONE, MCPA (all forms), PARAQUAT, PICLORAM (all forms), or TEBUTHIURON, then do not apply this pesticide in the species habitat. For ground applications do not apply within 20 yards of the habitat, or within 100 yards for aerial applications.
   ii. If the active ingredient is OXYFLUORFEN (granular or non-granular), then do not apply this pesticide in the species habitat. For ground applications do not apply within 100 yards of the habitat, or within 1/4 mile for aerial applications.

If the active ingredient is either METRIBUZIN or SULFOMETURON METHYL, then do not apply this pesticide on rights-of-way in the species habitat.

Colorado River Fishes (Colorado Pikeminnow, razorback sucker, humpback chub, bonytail) and Virgin River Fishes (Virgin River Chub and woundfin)

The BLM has incorporated Applicant Committed Resource Protection Measures into their plan that will minimize mortality or infury to these listed fish species.

Closing

The Service believes that an unquantifiable amount of incidental take will occur in the form of harm and harassment as a result of the proposed actions. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed actions. If, during the course of the actions, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Bureau of Land Management must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

REPORTING REQUIREMENTS

Upon locating dead, injured, or sick listed species, immediate notification must be made to the Service's Salt Lake City Field Office at (801) 975-3330 and the Service's Division of Law Enforcement, Ogden, Utah, at (801) 625-5570. Pertinent information including the date, time, location, and possible cause of injury or mortality of each species shall be recorded and provided to the Service. Instructions for proper care, handling, transport, and disposition of such specimens will be issued by the Service's Division of Law Enforcement. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state.

The BLM shall submit a report to the Service on or before (December 1) of each year in which fire management activities occurred within occupied habitat. For the listed and candidate species covered under this consultation, the report shall include: 1) the amount of potential and/or occupied habitat affected by wildfire (i.e. stream miles burned, percentage of drainage burned, fire severity map); 2) to the extent possible, the number of individuals killed from direct and indirect effects of wildfire; 3) any habitat and/or population monitoring efforts from past wildfire events; 4) a copy of the burned area emergency stabilization and rehabilitation plan; 5) implementation and effectiveness monitoring of burned area emergency stabilization and rehabilitation treatments; 6) implementation and effectiveness monitoring of the standard operating

procedures; 7) recommendations for enhancing the effectiveness of the standard operating procedures; and 8) any recommendations for additional standard operating procedures.

The first report shall be due to the Service on (December 1, 2005). The address for the Utah Fish and Wildlife Office is:

Field Supervisor
U.S. Fish and Wildlife Service
2369 West Orton Circle, Suite 50
West Valley City, Utah 84119
Telephone: (801) 975-3330